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culture

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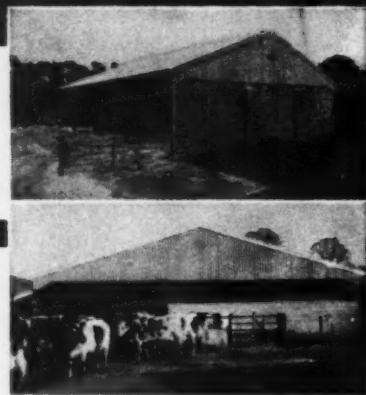
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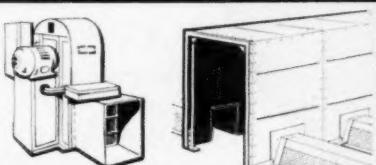
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Farm Secretarial Services

From the Secretary's Point of View

M. I. Stennett

IT is now some fifteen years since I started, with a bicycle and a fund of optimism, the first secretarial service in the north of England. It has been a challenging and very worthwhile occupation—the more so when one sees the relief of farmer clients in having the burden of their clerical work removed. Briefly, the main objects of a secretarial service are to undertake:

- (a) To relieve the farmer of his office work, including correspondence, filing, payment of accounts and completing all necessary Government forms.
- (b) The preparation of wages, PAYE records, N.H.I. pensions, etc.
- (c) The keeping of financial records.
- (d) Specialized farm-recording work, including the type of records required by the N.A.A.S., M.M.B., P.I.D.A., and the Ministry's Farm Business Recording Scheme.

Experience has proved that the work can be dealt with very efficiently either on the farm or in a central office. I have always found that the calculation of PAYE and the preparation of wages are jobs for which the farmer is especially appreciative. Such jobs can be done very successfully by postal service and many of my farmer clients avail themselves of this.

The service offered is essentially a flexible one and depends mainly on the size of farm and the mileage involved. In some cases a client may need a secretary for a half-day or a whole-day a week, or one day a fortnight or one day a month. Between visits the client can always ring the head office if he should require further help in the meantime. The service has

been designed for simplicity and efficiency, and with a view to releasing the farmer for his real job of organizing the management of his farm.

No real major problems have been encountered. As soon as the farmer has decided that he would like secretarial help he usually co-operates in every way. The fact that he is sometimes reluctant to approach a secretarial service is not, I feel, because he believes confidential information will be disclosed. I think the real reason is that he does not like admitting how behind he is with his office work. Sometimes the farmer wants to put his house in order before we take over. This I always discourage on the grounds that if everything was running smoothly he would not require the service.

I should like to stress two things. First, our dealings with every client are on the basis that everything is treated in the strictest confidence. Farmers soon get to know and appreciate this and know that we would never let them down. Secondly, we do not attempt to encroach on the preserves of professional accountants. The preparation of final accounts and the settling of the farmer's tax liabilities are not, in the normal way, the work of a secretarial service and this we leave to the accountancy profession.

Where feed allocation records have to be kept we often have the problem of persuading the member of the farm staff responsible to let us have accurate details of feedingstuffs used and other data required for costings purposes. However, I am glad to say that this situation is improving.

Our one real grumble is the inadequacy of the offices or accommodation that we are sometimes asked to work in. They are often very cold, far too small and with very inadequate lighting.

The qualities which go to make a competent secretary are honesty, integrity and loyalty—that is, of course, in addition to technical ability. She also requires initiative and self-reliance, and a sense of awareness of what is going on at any particular time. She also needs to know when various forms are due for dispatch and whether, for example, applications for grant-aided schemes have been dealt with. In other words, she requires to be helpful in every way to the farmer client—and this sometimes includes babysitting! In addition to being interested in the job, secretaries should have a keen sense of humour and an ability to see a job through. It is a specialized job—a personal service which must be maintained—and I believe it has a great future throughout the country.

Courses at agricultural centres are proving a great help in the training of secretaries, but in my opinion more time could usefully be spent on the secretarial instruction with possibly less time on the teaching of husbandry subjects. The latter training should be kept to a minimum sufficient to give students a background knowledge of farming.

I think the day has come when agriculture has realized the great importance of secretarial services for farmers. In a few years' time we shall probably look back on 1965 as the turning point when, for the first time, this important service was offered to farmers throughout the country by many very experienced agencies. I hope that, in the general rush to get on to the band wagon, we shall not find that too many inexperienced people have joined the queue.

The author of this article is **Miss M. I. Stennett**, who ran her own farm secretarial service for fifteen years and who recently took up appointment as Development Officer of N.F.U. Services Limited with headquarters at Nantwich, Cheshire.

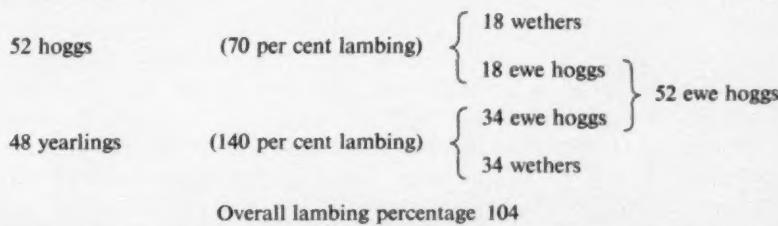
Changes in Border Sheep Farming

R. Hart

MANY breeds have played their part in the sheep farming of the Welsh Border country, but for many years now the Clun and, to a lesser extent, the Kerry Hill have held sway over all their rivals. Not only have these two breeds been kept almost exclusively, but the uniform system of management, geared to selling two-year-old breeding ewes, is not found elsewhere. There are, however, indications that many farms are changing or are about to change their sheep policy. As any major change would affect not only the local trade but also the supply of breeding ewes for farms on lower land, it is worth looking for the reasons behind the new thinking. There is evidence that, for some farms at least, a change of system could have a considerable effect on farm profitability. The importance of sheep in the area can be seen from the fact that on the 91,162 acres of the Craven Arms district of Shropshire there were 99,032 breeding ewes at June, 1965.

The present system

The system at present revolves round the large autumn sales of mainly two-year-old ewes held in the market towns of the border, and so the typical flock follows the following pattern. Each year all ewe lambs are retained; the wether lambs are sold either fat off grass or roots or as store lambs in late autumn. The majority of ewe hoggs are tupped in their first year and in the following year as yearlings. They are then sold in the next autumn. Each season 50 per cent of the flock lambed consists of hoggs and 50 per cent of yearlings. It will be seen immediately that to maintain flock numbers so as to sell a steady number of ewes each year, lambing percentage has to be kept well up; some farms find it necessary to purchase ewe lambs or yearling ewes. The following diagram shows that percentages of 70 and 140 for hoggs and yearlings respectively are necessary if the size of the flock is to be maintained.



A recent two-year survey showed that, on average, only 7 farms out of 41 investigated actually achieved the necessary lambing percentage. The



Some of a flock of 120 three-year-old ewes which had a lambing percentage of 200 in 1961. They are seen grazing winter wheat in mid-March, a common practice in the Craven Arms district

profitability of this system is influenced by other factors which affect both output and costs. One factor is the price obtained for the breeding ewe. There are obviously big differences in price according to the quality of the ewe, but the breeder is also vulnerable to the whims of the market on the day he chooses to sell. It is a serious matter, particularly for the smaller farmer who will sell his ewes on no more than two occasions, that his farm income can fluctuate from year to year according to such factors as the state of the harvest in the traditional purchasing areas or the position of his pen or pens of ewes in the sale. The more stable fat lamb market must therefore have considerable attraction.

Costs

The cost of labour tends to be high. The work involved in shepherding these flocks is considerably greater than one would expect for flocks of older ewes that produce fat lambs. Except where, with smaller flocks, the farmer is prepared to do all the work himself, labour becomes a major item. Feed costs also tend to be high because of the need to grow the hoggs and yearlings during their first and second winter, and also because flocks are lambed relatively early in order that the hoggs are well enough grown to be tupped the following autumn. Another disadvantage, compared with lamb-selling flocks, is that the capital investment in livestock per unit of output is greater and the turnover slower.

The table on page 151, taken from the previously-mentioned survey*, shows that, up to 1960 at least, selling ewes left a better gross margin per ewe than selling lambs, in spite of the difficulties. However, on an acreage basis or on a full cost basis, where labour is included, it can be seen that lamb-selling flocks were doing better.

In recent years there has undoubtedly been some change towards fat lamb production in the Border country. Since the survey was completed there has been a fall in the average price received for two-year-old ewes of approxi-

*Jones, D. O. (1964). *Store Cattle and Sheep Rearing in South-West Shropshire*. Univ. Manchester, Bull. No. 105/EC 59.

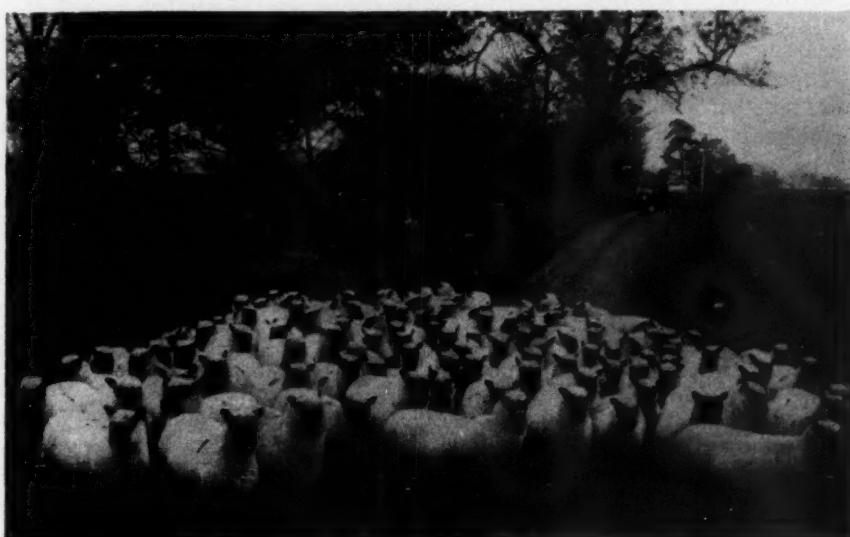
mately 20–25s., while the average return for fat lambs has changed very little. The guaranteed price in 1965 was 1d. per lb dead weight less than in 1960. The quality of the grassland in the area is steadily improving and more farmers are finding it possible to finish lambs satisfactorily. Many continue to keep the native Clun and Kerry Hills, but an increasing number of Welsh and Scotch Half-breds are appearing.

	6 farms selling lambs		41 farms selling ewes	
	1958–59 1959–60		1958–59 1959–60	
	£	£	£	£
Livestock output/ewe (a)	9.93	9.50	13.54	12.62
Foods	2.22	3.04	4.56	4.27
Miscellaneous costs	0.57	0.73	0.93	0.95
Total variable costs (b)	2.79	3.77	5.49	5.22
GROSS MARGIN/EWE (a—b)	7.14	5.73	8.05	7.40
Ewes/livestock acre	2.15	2.00	1.45	1.48
Labour hours/ewe	6.53	8.60	11.68	11.85

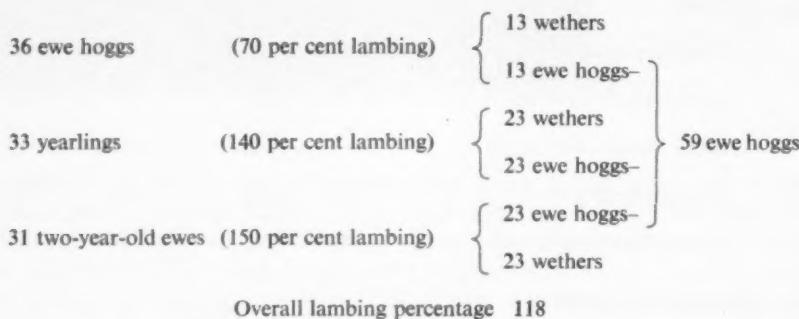
An alternative system

Tradition dies hard in the hills, however, and many farmers would like to continue selling breeding ewes while at the same time overcoming some of the difficulties encountered with the present system. One way of doing this is to sell not at two years old but at three. A few people have been doing this for some time and others, where difficulty in maintaining flock numbers has been experienced, have kept a small number of older ewes in order to save buying ewe lambs or yearlings.

Yearling ewes from a prize-winning flock in Herefordshire



There would be a number of advantages and disadvantages associated with a wholesale change to selling older ewes. The main advantage is that each lambing season only one-third, as against one-half, of the flock lambed is made up of ewe hoggs. This eases the burden of wintering large numbers of in-lamb hoggs and also reduces the amount of shepherding necessary. It also increases the lambing percentage of the flock as a whole because one-third of it now comprises prime two-year-old ewes. This, in turn, means that more wether lambs are sold and also the pressure of maintaining flock numbers is eased, allowing selection of ewe lambs for tupping. Farmers who have changed to this system admit that the quality of their flocks has improved due to this last factor. Diagrammatically we can represent the new system as follows:



Against these advantages must be set the reduction in price of approximately £1 which is generally expected for a three-year-old ewe as against a two-year-old ewe, and that only one-third instead of one-half of the flock is sold annually.

Profitability

If one assumes equal performances in terms of lambing percentage and price for each age of ewe, there is very little difference between the gross outputs of flocks on the two systems. However, it would seem likely that the costs of the three-year-old system are lower. As far as the purchaser is concerned, he is likely to get almost the same life out of his breeding ewes whether he buys two-year-old or three-year-old ewes, as most are sold fat before either age or infirmity stops their breeding ability. This view appears to be gaining ground as recently the differential in prices appears to be decreasing.

The major influences on the profitability of sheep flocks, whether selling ewes or lambs, are lambing percentage, prices received and stocking rates. The vast range in performance achieved for each of these factors means that budgeting in general terms can show an equally wide range of profits when comparing one system with another. It does seem clear, however, that the performance of each flock should be examined very closely by its owner. It could well be, as many farmers are finding, that a change of system is indicated.

This article has been contributed by R. Hart, B.Sc., Dip. Farm Man., who is a N.A.A.S. District Agricultural Adviser in Shropshire.

Swedes in the Sixties

C. Kinsey

SWEDES were one of the four principal crops of the Norfolk four-course rotation established in the eighteenth century, and for more than a century they were the most important fodder root crop in this country. Over the years they have declined in importance as the following table shows:

<i>England and Wales</i> (thousand acres)					
1874	1896	1916	1936	1954	1964
1,633	1,408	932	448	250	145

One of the main reasons for the decline has been the increasing shortage and cost of the necessary manual labour for growing and harvesting the crop. There are, however, still some 145,000 acres in England and Wales and in many areas, e.g., the sheep-producing areas of the border counties of Herefordshire and Shropshire, it is an important crop on many farms and is highly esteemed by flockmasters. Furthermore, two important developments during the last decade in the mechanization of the crop, namely, precision drilling and mechanical harvesting, and the use of herbicides for weed control, have now made it possible to grow crops of swedes economically and without much hand labour.

Precision drilling

Precision drilling is now widely practised in most of the swede-growing areas. The success of the precision drilling method is such that, without resort to hand labour for singling and hoeing, crops can be grown which are as good as those where singling is by hand. The following figures illustrate the point.¹

	Tons per acre	
	1956	1957
Normal drilling and thinning	20½	24
1 in. and 2 in. precision drilling and thinning	24½	23
6 in. precision drilling, unthinned	27½	24½

By precision drilling it is possible to eliminate up to 30 man-hours per acre involved in hoeing and singling following the traditional method of sowing. Furthermore, as hand hoeing and singling operations often occur during the haymaking season, a peak labour requirement period can be considerably reduced or eliminated by precision drilling. To achieve success in precision drilling, it is essential to have a fine even seedbed, a drilling speed of not more than 2 m.p.h. and the use of graded high-germination dressed seed. When the seed is sown at about an 8 in. spacing no hand work



Precision-drilled
swedes at 7 in.
spacing, not hoed
or singled after
drilling

for singling should be necessary; the following figures show that within limits yield per acre is not affected by the spacing between the plants.²

Plant spacing (in.)	8	12	16	20	24
Yield (tons per acre)	27.2	28.1	27.6	28.6	26.1

Weed control

As yet post-emergence herbicides are not available for the swede crop, but the stale seedbed technique of annual weed control can often be successful. The method consists of preparing a good seedbed 2-3 weeks before sowing, and either spraying the seedling weeds with a contact herbicide 1-2 days before sowing or spraying and sowing in one operation. The cost of the herbicide is 40s. to 60s. per acre. The success of the stale seedbed method depends largely on soil moisture conditions being suitable for the germination and growth of the weeds between seedbed preparation and sowing.

Another successful method of reducing or eliminating weed competition is growing the crop immediately after a ley cut for silage or early hay. In these circumstances the crop is virtually a catch crop and consequently both time and cost in its production is saved. The practice often means relatively late sowing, however, and therefore some loss of yield; recent experiments have shown a 5 tons per acre loss of crop from mid-late June compared with mid-May sowings. In some years (about 2 in 10) it will be necessary to spray the crop against aphids and mildew, particularly if it is sown early.

Mechanical harvesting

The cost of lifting and carting the crop to the homestead often amounts to 40 per cent or more of the total costs and has been one of its major drawbacks. In the last decade, however, progress in mechanical harvesting has cut harvesting cost by 50 per cent or more. Harvesters for mounting on the 3-point linkage of the tractor are now available. They can top, lift and elevate into a trailer a 30-ton per acre crop at the rate of about one-third of an acre per hour. Such a machine costs about £350 and could be shared by a number of growers to advantage in many areas.

Utilization

Swedes can produce a high output per acre of winter feed for sheep and cattle and in this respect are surpassed by few other fodder crops. In many

areas much of the crop is eaten by sheep in the field, and a 25-ton per acre crop will provide 100 fattening pigs with most of their food requirements for about four weeks and produce a liveweight output of about 400 lb per acre. Crop wastage, however, can be substantial and may be up to 25 per cent of the total weight when the crop is not efficiently folded. In other areas the crop is used for wintering the breeding flock and provides an economical and safe supplementary feed.

The high cost of labour for harvesting the crop by hand was probably the main factor which led to the decline of swedes for indoor feeding, but the mechanization of harvesting has opened up new possibilities of the crop for this purpose. Enterprise cost accounts in respect of crops grown in Scotland in 1963³ show costs as high as £70 per acre for hand-hoed and harvested crops, £43 per acre for mechanically-harvested crops and £26 per acre for crops not pulled, i.e., eaten off by sheep and cattle. The labour element is the prime factor and amounts to 96 hours per acre for hand-hoed and harvested crops (including 20 hours for hoeing and 48 hours per acre for harvesting). Mechanical harvesting reduced harvesting time to 9 man-hours per acre. Where the crop was eaten off in the field, the labour requirements were much lower. Where carting and spreading FYM was not involved, labour inputs were as low as 18 hours per acre overall, including 7 hours for row crop work, which in many cases can also be eliminated. Thus, it is possible to grow and harvest mechanically a crop of swedes for a total input of about 20 man-hours per acre.

For precision-drilled crops which are eaten off there should be no serious problem of peak labour requirement. For mechanically-harvested crops the labour problem largely consists of about 9 hours per acre in the winter months, and on most farms this work can be undertaken by the regular farm staff.

The variable costs may, therefore, be no more than £6-£7 for seeds and fertilizer, and even if casual labour is required for both harvesting and some hoeing, the total variable costs may not exceed more than £11-£12 per acre. This might be regarded as a modest cost for a relatively high yield of 2½ tons of dry matter which is equivalent to about 35 cwt of starch equivalent per acre and which compares very favourably with that of other home-grown fodder and grass crops.

Although the problems of disease-resistant varieties and post-emergence herbicides have yet to be solved, the technical developments in recent years have given swede growing a new look which merits its consideration on many farms where soil and climatic conditions are favourable and where livestock, particularly sheep, production is being intensified. For cattle feeding the main management problem now arises over the labour needed for indoor feeding. This is a problem which should not be beyond the wit of the engineer to solve.

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Agricultural Structure Policies in the Common Market



by G. W. Ford

IN this century in much of Western Europe far-reaching developments in farming have been taking place as a result of new techniques, improved livestock and increased mechanization. These developments have outpaced changes to the systems of land tenure and in the size of holdings. In many of the European countries the failure of the agricultural structure to adjust itself quickly enough has reduced the potential efficiency that farming could have attained. Many factors have contributed to the imperfections in the agricultural structure of a region. These include too many farms of the wrong size (usually too small) for the optimum combination of production factors (labour, land and capital), out-of-date systems of land tenure or inheritance laws, inadequate public utility services, inefficient transport facilities including the road network, an imbalance of the types of production in relation to the region's marketing requirements, and badly-planned urban and industrial development.

The governments of Western Europe have acted in various ways to encourage changes in farm structure so that the contribution of agriculture can be more effective within the national economy. As in the United Kingdom, the numbers of those actively engaged in farming in Western Europe have been declining, but at a greater rate than in the U.K. Recently the British government has been considering steps to improve the farm structure in Great Britain, and it is interesting to compare the size of the farms and the actions that have been taken in other parts of Western Europe for similar purposes.

Comparison in the size of farms

The continental European figures below were obtained from censuses taken in the late fifties or early sixties on a hectare basis. These figures have been converted approximately into acres for comparison with the United Kingdom.

Size of farms in the European Economic Community (%)

Acres	Germany	France	Italy	Netherlands	Belgium	Luxembourg
1—12½	44.7	30.4	64.7	38.1	48.5	31.5
12½—50	45.3	47.4	29.5	50.4	44.2	44.8
50—125	8.8	17.7	4.1	10.6	6.2	21.9
125—250	1.0	3.5	1.0	0.8	0.9	1.7
Over 250	0.2	1.0	0.7	0.1	0.2	0.1
TOTAL	100	100	100	100	100	100

Size of farms (%)

Acres	European Economic Community	United Kingdom	Acres
1—12½	48.5	38.6	1—15
12½—50	39.5	24.8	15—50
50—125	9.6	23.8	50—150
125—250	1.8	8.8	150—300
Over 250	0.6	4.0	Over 300
TOTAL	100	TOTAL 100	

Number of farms (thousands)

Acres	European Economic Community	United Kingdom	Acres
1—12½	3,113	172	1—15
12½—50	2,689	110	15—50
50—125	653	106	50—150
125—250	120	39	150—300
Over 250	44	18	Over 300
TOTAL	6,619	TOTAL 445	

If size can be regarded as a contributing factor to efficiency, the United Kingdom has some advantage over the Common Market countries in this respect. No one doubts that the agricultural potential in the Community could be increased with an improved farm structure.

The European Economic Commission's role

This body, which is the executive organ of the European Economic Community has, in terms of money and staff, been more concerned with the development and administration of agriculture in the Community than with any other matter. It is responsible for the managed marketing schemes of farm produce in the Community, and already some 85 per cent of the farm output is managed in this way. The economic integration of the agricultural activity of the six member states is accelerating the need for radical changes in the agricultural structures of the Community, especially as regards the transfer of unwanted farm labour to other worthwhile jobs. Some of the Community decisions could provoke awkward situations within the farming structure unless counter-measures are taken. It is understandable, therefore, that an important effort of the Commission is devoted to improving the agricultural structure.

Year by year since the establishment of the Community's Guarantee and Guidance Fund, increasing sums have been earmarked for schemes to aid

the reform of the agricultural structures in the six member states. The statutory regulation of the Commission on this matter provides that grants may be made from this fund for:

- (1) the adaptation and development of agricultural production;
- (2) the adaptation and improvement of the conditions of production in agriculture;
- (3) the adaptation and improvement of the marketing of agricultural produce;
- (4) the development of outlets for agricultural produce.

Before June, 1965, when difficulties arose over policy matters in the Community, the Commission estimated that expenditure from the Guarantee and Guidance Fund for agricultural structure aids would be of the order:

£ million			
1962-3	1963-4	1964-5	1967-8
3·4	6·5	20·0	100

If the present system develops as planned, much more than £100 million a year is likely to be spent in subsequent years.

The Commission, in pursuit of Community policy, takes account not only of economic factors but also of social considerations and of the special development problems in backward areas within the Community. Thus the objectives include:

- (1) To ensure for all categories of workers in agriculture and their families social protection equivalent to that enjoyed by other categories of workers.
- (2) To adapt contractual relations among landowners, farmers and farm workers to the present state of social progress.
- (3) To improve the social situation of agricultural wage-earners, bringing it closer to that of wage-earners in other comparable branches from the point of view of pay, including social benefits, and working conditions, taking into account the special features of agricultural work.
- (4) To ensure that children coming from a rural environment have the same opportunities of general education and occupational training as children from other environments, so that they may be on an equal footing as regards the choice of a career, whether in farming or not.
- (5) To help young farm workers wishing to set up on their own account or to change their job in the agricultural sector.
- (6) To ensure the best chances of success for those leaving the land to take other paid employment, in particular with the help of the European Social Fund.
- (7) To make it possible for farmers and farm workers to retire when they have reached the normal age for ceasing the active pursuit of their occupation.
- (8) To improve and modernize rural housing.
- (9) To enhance the social and cultural capital of country districts.

In this context 'family farms' are considered an important feature to be preserved, and are defined as farms capable of providing full-time employment for at least one or two farm workers and which will, with rational management, ensure that the farm workers' wages compare reasonably with similar workers in other industries.

The Commission deals with structure policy in several ways. Firstly, there are regular opportunities for an exchange of information among the Commission and the member states: this includes the presentation of annual reports. Secondly, it grant-aided through the Community Guidance and Guarantee Fund suitable and approved projects, sponsored by member states; the maximum grant is 25 per cent. Thirdly, it has the right to comment (and to publish those comments in its official gazette) on member states' proposed farm structure improvement schemes, whether they are concerned with land reform or accelerated retirement and pension schemes. Its guiding principles in carrying out this policy include:

- (1) the scheme must be designed to remove the causes rather than just combat the effects of low incomes;
- (2) production must be reorganized as necessary to achieve the optimum combination of the factors of production on all farms which can be reasonably expected to show a profit;
- (3) in certain rural areas (e.g., those of under-employment) a full-scale reorganization of the technical and socio-economic infrastructure is required;
- (4) the scheme, where necessary, must fit in with the common agricultural policy of the Community and as appropriate assist the farming of the area to comply with the needs of that policy;
- (5) the scheme must provide adequate assurances that its economic effects will be lasting.

Member state schemes

Apart from schemes and projects which the European Economic Commission helps to finance, the member states have developed their own schemes, some of which, in one form or another, have been going on for a long time—in some instances before the establishment of the Commission. Member state schemes vary considerably from one another because of the widely differing conditions, e.g., the type of agriculture, its efficiency, the systems of land tenure, the geophysical situation, the age structure of those engaged in farming, the marketing and (if any) co-operative arrangements, the length of time that a scheme has been in existence and the impact of that scheme, and the farm structure of the country. Nevertheless, the Commission co-ordinates as far as possible the various schemes of the member states and, as the agriculture of the Community is further integrated, this work of co-ordination will be greatly facilitated.

(A subsequent article by the same author will deal with some of the schemes in the member states of the Community)

This article has been contributed by G. W. Ford, who is Counsellor (Agriculture) to the U.K. Delegation to the European Communities at Brussels. He was previously South-Western Regional Controller of the Ministry of Agriculture, Fisheries and Food and between 1956-58 was Agricultural Development Adviser to the Government of Malta.

Heathland Reclamation in East Suffolk

(1)

G. R. Field

BETWEEN the A12 and the sea, extending north-eastwards from Ipswich to Aldeburgh, lie some 10,000 acres of very acid heathland. Just over half the area has long been successfully utilized by the Forestry Commission, but until the late forties local light-land farmers, wary of the natural infertility, had made no serious attempts to bring these heaths into cultivation. However, increasing confidence in the powers of machinery and lime, coupled with the availability of ploughing grants, encouraged the first pioneers to try their luck at reclaiming these derelict open spaces.

Reclamation process

Reclamation began in 1949 and the first task was clearing the scrub trees and filling-in old army trenches. Dense areas of heather required deep ploughing. Latterly, the forage harvester and rotary cultivator have been freely used to mulch the natural vegetation with a little soil. Dressings of lump chalk up to 20 tons per acre were applied to correct the obvious acidity before the first ploughing, which was timed for July to prevent regeneration of the bracken fronds. Pioneer crops of winter rye were sown and yields of about 20 cwt per acre were obtained in the first few years. Experience soon demonstrated that effective rabbit netting was as essential for full yields as the use of adequate lime and fertilizers.

Acidity problem

In the early fifties rye prices were low and so barley was tried. Such crops were soon adversely affected by acidity. Large patches of unthrifty growth appeared and were often accompanied by numerous smaller ones no more than a yard in diameter. The uneven coverage given by lump chalk, which had been shovelled out of the back of a lorry, was largely to blame but not entirely. Contributory factors were lack of cultivation to incorporate the chalk through the ploughed depth, the very low initial pH of the soil (often no higher than 4), and finally the low rainfall. Dry spells, often three weeks in duration, are common in spring in this area, where the average rainfall is 21–22 inches per annum.

In subsequent years more chalk, this time finely-ground, and further cultivation, removed this localized acidity. Today, six tons per acre of finely-ground chalk are thoroughly worked into the surface before the initial ploughing, and a similar treatment is given after ploughing 12 inches deep. As a result top soil acidity is no problem after the first year.

Copper deficiency

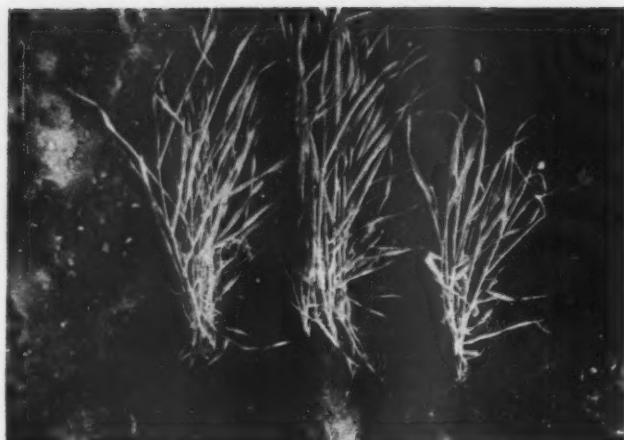
Subsequent spring barley crops progressed satisfactorily through April and May, and promised good yields until they reached the jointing stage. At this point large areas of the crop began to show whitening along the margins of the youngest leaves, which was shortly followed by whitening and withering of the leaf tips and failure of the ears to emerge. Although the condition was first thought by farmers to result from drought, it was shown by the N.A.S. soil chemists to be due to copper deficiency.

This first local diagnosis of the deficiency was made on Wantisden Heath in 1951. Unrecognized in the district before, this deficiency was disastrous in its effect on yield but surprisingly cheap to prevent by corrective spraying. It only required $\frac{1}{4}$ lb copper sulphate per acre in 60 gallons of water (plus a spreader), applied in late May, to transform yields of 3-4 cwt per acre into potential 18-20 cwt yields. The cost of the material used was 9d. per acre. In 1952 the N.A.S. soil chemists laid down a trial on Wantisden Heath to compare the efficiency of soil-applied copper with that of copper sprays. This work showed that soil dressings of 60 lb per acre of copper sulphate would prevent copper deficiency occurring in barley for at least seven years. During this time soil treatment gave slightly superior results to annual spraying. As a by-product, the trial demonstrated that insufficiency of copper for normal plant growth was due to a true soil deficiency and was not entirely induced by over-liming.

Whilst barley and oats responded dramatically to copper, it was observed that the more reliable winter rye often showed some blindness in the lower spikelets of the ear. This defect proved to be another symptom of copper

Forage harvester mulching heather and bracken





Barley plants showing manganese deficiency (left) and copper deficiency (right) in the same field. Normal plants in centre

deficiency. Rye is seldom treated, however, because it rarely receives a herbicide spray with which the copper can be conveniently combined. For this reason and the initial cost in the first year, soil application of copper has not proved popular. Copper sulphate has now been replaced by copper oxychloride or cuprous oxide as spray materials. These latter cause less leaf injury through scorching, persist longer on the leaf in showery weather, and can be applied in much lower volumes of water.

Experimental areas of sugar beet on this land also responded to similar applications of copper. Although visual symptoms were absent, an extra 5 cwt per acre of sugar were obtained as a result of treatment.

Erosion

Reclamation was invariably followed by three or four consecutive cereals, but the mixed results obtained, the free-working nature of the soil, the belief that the acidity problem had been overcome, the desire for a rotation and the prosperity of the fresh vegetable market at the time encouraged some pioneers to try carrot-growing. For the first time the soil was completely unprotected by vegetation from March to May. The porous nature of the soil allowed rapid drying of the surface tilth by evaporation. In addition, the tilth contained virtually no crumb structure and was made up almost entirely of individual particles of sand and inert organic matter. Consequently a strong wind from any quarter in these open spaces produced spectacular erosion, and deposited soil, seed and fertilizer on the headlands or nearest roadway. Land left 'on the roll' was especially vulnerable.

Strip cropping with rye and cocksfoot for seed has greatly reduced this regular menace. Attempts to use lucerne as a soil improver, as practised at Elveden, were costly failures. The strongly acid subsoil confined the roots to the top foot of soil. During the first dry spell of two weeks or more after establishment the crop would rapidly exhaust its moisture supply and die. As a long-term measure an increasing number of coniferous belts have been planted to protect those areas especially vulnerable to wind erosion.

Magnesium deficiency

If the root crops escaped erosion damage, they made quick early growth. However, they rapidly lost their uniformity as magnesium deficiency

developed areas of pale, stunted foliage. In potatoes the condition was easily recognizable, but this problem in carrots was often difficult to diagnose because of confusion with nitrogen deficiency and Motley Dwarf Virus. The regular use of magnesium in the fertilizer programme in the form of Kieserite at 3 cwt per acre for potatoes or carrots, and Kainit containing magnesium for sugar beet, has prevented further troubles with this deficiency. Cereals following root crops that had been treated with magnesium fertilizer have benefited from the residues in the soil.

Manganese deficiency

Calcium, copper and magnesium were not the only minerals to prove in short supply on the heaths. After five or six years in cultivation, the original heavy dressings of lump chalk and the subsequent fine chalk began to exert their maximum effect on the pH of the soil. Areas of pale green plants in barley and rye crops appeared as early as March and April, and were found to be caused by manganese deficiency. This early appearance of the deficiency in the growing season has often meant that two spray treatments of manganese sulphate at a month's interval are required for normal growth. On the other hand a forward crop of winter rye can show unmistakable manganese deficiency one week, and can be quite normal and healthy-looking the following week. The explanation is that shortly after spring growth commences, rye roots begin to explore the acid subsoil wherein manganese is more freely available.

Manganese deficiency is not always associated with high alkalinity in the top soil, and it is often diagnosed where the pH is around 7.0. It is likely that the severe leaching of manganese into the subsoil during the formation of these heaths has left very low levels in the top soil. In the absence of high organic matter and lime levels, a response to soil-applied manganese is a possibility which it is hoped to investigate with field trials.

Boron deficiency

As might be expected, boron deficiency is a near-certainty in sugar beet on this land, but unlike copper and manganese, local farmers in this light-land area were alert to the danger and have successfully taken the usual preventive measures.

(In a subsequent article, to be published next month, Mr. Field will continue his story of heathland reclamation in East Suffolk and will consider the economics of the operation.)

This article has been contributed by G. R. Field, B.Sc., who is a N.A.A.S. district adviser in the Woodbridge area of Suffolk.

Capital Investment Analysis and the Economic Life of Farm Buildings

R. B. Sayce

THERE is growing need today to scrutinize capital investment in agriculture much more critically. The capital invested in the United Kingdom has increased steadily in the past decade. This is shown in Table 1, and the increase in capital invested in buildings and works amounts to 2½ times in the period 1953 to 1963. It is evident that this increase has continued up to the present day. The expected provision of a further £80 million under the Farm Improvement Scheme could mean, since the Agriculture Bill provides for 25 per cent grants, that there will be additional capital investment of £320 million in the coming years. In the National Plan, the Government stated that 'The modernization of agriculture through the provision of up-to-date and improved farm buildings has been, and will continue to be, an important factor in saving labour and so achieving a further increase in productivity'.

Table 1

Gross fixed capital formation in agriculture in the United Kingdom¹

<i>Type of asset</i>	(£m—Current prices)			
	1953	1956	1960	1963
Buildings and works	23	27	45	59
Vehicles	18	17	24	19
Plant and machinery	49	50	72	90
All fixed assets	90	94	141	168

The growth of capital formation is most noticeable in buildings and works. In a recent review of long-term investment in agriculture, Dobb and Griffiths stated: 'Bearing in mind the volume of investment in recent years, it seems likely that the most obvious and remunerative long-term improvements have already been made on the majority of full-time farms, so that the opportunities for making further gains in efficiency by injecting additional capital *will need to be closely examined*'. (My italics)².

Critical examination

Carrying out a critical analysis of possible capital investment will result in many factors being studied. The more important of these may depend on the motives and status of the investor. Not all landlords invest in fixed equipment on tenanted farms in order to maximize the return in the form of rent. The level of tax liability, possible tax reliefs, the liability to estate duty, capital appreciation, amenity value, the prestige of ownership, and, indeed, the obligations of ownership are all possible contributory factors to investment which in sheer money terms may not appear worth while. Similarly, the owner-occupier is not always guided solely by the return as profit from the investment. These sort of factors cannot easily be converted into £ s. d.; they cannot be statistically represented in answering the question: Is the return to be expected commensurate with the capital invested? To answer this question in economic terms the basic facts needed are:

1. The annual cost of the capital employed; whether borrowed or re-invested from liquid sources.
2. The expected return either as increased rent or increased profits, or the prevention of a diminution of these.

Investment analysis

To find out the annual cost of capital investment it is necessary to use one of many methods. But all rely on charging interest on the capital employed and then depreciating or paying back the capital over a period of years. A very simple method is to assume that the money is to be borrowed and then repaid in equal annual instalments over a fixed period. Thus interest is charged on the outstanding balance at the end of each year. A simple example is to assume £1,000 borrowed for ten years. The annual cost over the ten years is:

	£
£1,000 repaid in equal annual instalments of £100 over 10 years	100
Interest at 7 per cent: average over 10 years is half this rate on £1,000, i.e.,	35
Annual charge	<hr/> 135

Where the capital is actually to be borrowed, the annual charge can be read off mortgage repayment tables. These give a flat-rate yearly charge based on interest on the original capital sum plus an annual payment which, at compound interest at the same rate, will accumulate to the original capital sum at the end of the chosen borrowing period.

A more sophisticated method will allow the compound interest on the sinking fund at a different rate than the rate on the principal. Thus for £1,000 re-invested from liquid resources the annual charge for ten years might be:

	£ s. d.
Interest at 7 per cent on £1,000	70 0 0
Annual sinking fund at 3 per cent cumulative interest to replace £1,000 at the end of 10 years	87 4 0
Annual charge	<hr/> 157 4 0

Multi-purpose Building – the Annual Cost

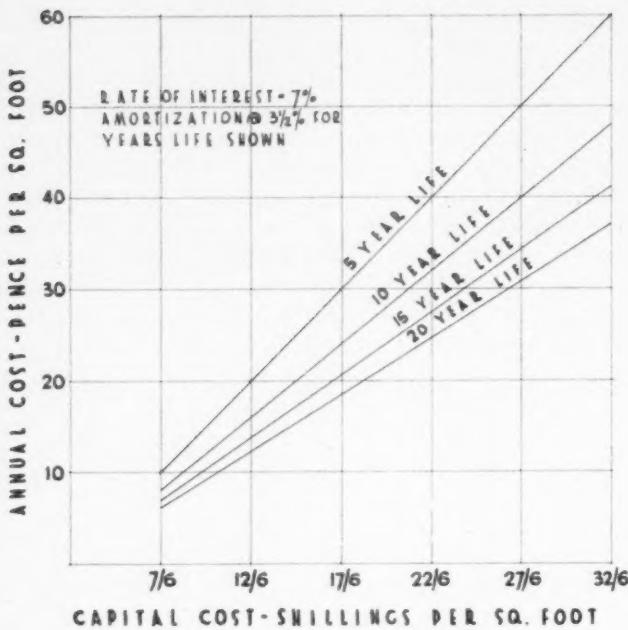


Figure 1.

Fattening Piggery – the Annual Cost

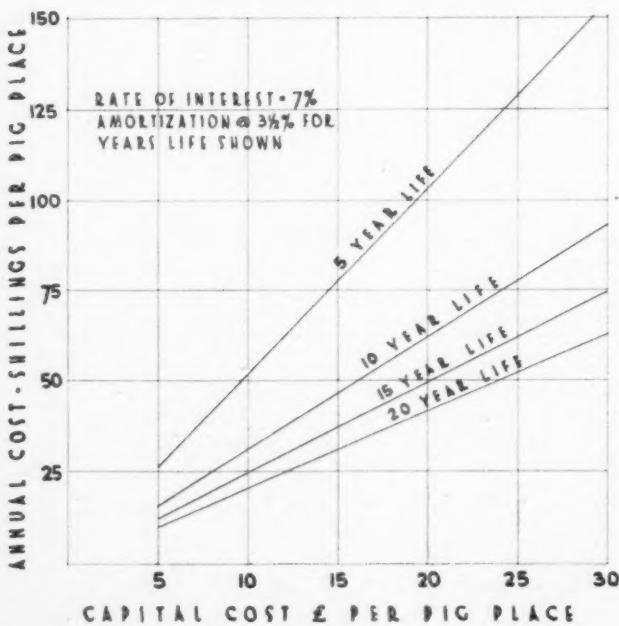


Figure 2.

This gives a more realistic charge for the re-investor. It also can allow for the fact that payments to a sinking fund are out of taxed income. The method chosen should suit the investor and be related to the source of the capital.

Economic life

It should be noted that a fixed period is chosen: this may be variously called pay-back period, sinking-fund period, depreciation, or amortization life. It is the assessment of this period or life which is the most difficult judgment in any method of assessing the annual charge. The best definitions are probably economic life or investment life; the former is in more common usage. This economic life is not the same as physical life or structural life. Indeed, the two may bear little relation to each other. As one writer has put it; 'Economic life is primarily a question of earning power, with structural durability of a secondary consideration provided the materials used in construction will physically last the period decided on without excessive repairs'³.

Determination of the economic life of a farm building requires first an estimate of the likely return and then a judgment of the length of time that such return can be maintained. If the return can be maintained by putting the building to an alternative use, then the life may be increased. This is why multi-purpose buildings can be assessed on long economic lives. So a definition of economic life might be the longest reasonable period during which the planned net return can be maintained. Net return would be calculated after charging the annual cost of the building plus other costs such as maintenance and insurance.

Annual cost and profitability

It is currently being suggested that all economic lives should be the shortest possible pay-back period, and lives as low as five years for permanent specialist buildings have been suggested. The graphs at Figures 1 and 2 reveal this as fallacious and misleading. With the shorter period, the annual cost rises very steeply as the capital cost increases. Figure 2, which relates to pig housing, brings this home more forcibly, particularly when it is remembered that the graph takes no account of the other annual charges, such as maintenance and insurance. The average net return when specialist pig housing, costing £16 per pig place, is given an economic life of 10 years, is shown in Table 2 (page 168).

The interpretation of this example is either that much better than average results must be produced and maintained, or that a longer economic life must be taken, or that the capital cost must be reduced. This is no paradox: it explains why landlords in general prefer the multi-purpose building with its lower, but longer, return. It carries a warning for the owner-occupier that the specialist building must maintain higher-than-average efficiency for longer than five or even ten years, if the net return is to be reasonable.

Deciding the life

To propound a maximum life of years for all kinds of farm buildings is bound therefore to be not only crude, but probably misleading. Any analysis of a projected capital investment must be related to the return, and

Table 2

CAPITAL INVESTMENT ANALYSIS	£ s. d.	£ s. d.
Capital: gross cost per pig place	16 0 0	
Annual cost per pig place:		
(a) Interest on capital @ 7%	1 2 5	
(b) Sinking fund to recoup capital over 10 years @ 5%	1 5 7	
(c) Maintenance, insurance, etc.	3 3	
Total		2 11 3
Annual capital cost per pig (assuming throughput of 2 heavy hogs per pig place)		1 5 7
AVERAGE RESULTS ⁴		
Average production costs per heavy pig:		
(a) Fattening cost	12 16 9	
(b) Weaner cost	4 18 10	
Total cost		17 15 7
Price received per pig		19 16 6
Profit per pig before charging for piggery		2 0 11
NET RETURN		
Profit per pig after charging annual cost of piggery		15 4

it may be that the economic life must be adjusted so that the annual cost can be borne by the expected return, if the amount of capital is to remain the same. It may be that the result of the analysis will influence the design of the building, and for this reason alone it is imperative that an examination of the capital investment position be made before any attempt at planning and designing buildings is started. Furthermore, where individual buildings are linked in one common enterprise, then the individual buildings need separate assessment. Thus a dairy enterprise contains milking parlour and dairy, housing accommodation and food storage. Each may have a different economic life and may be assessed separately:

Milking parlour and dairy	(say)	10 years
Yard (bedded and feeding area)	(say)	25 years
Tower forage silo	(say)	15 years

These figures are no more than a guide: we must go back to the definition of economic life given above and in each case make a subjective judgment of risk and probability. According to Smith, 'Rapid changes in farming techniques imply that specialized forms of fixed equipment may become obsolete in design after a fairly short period . . . the period depending on the degree of specialization'⁵. At a conference at Sussex University in March, 1965, it was suggested that framed buildings for hay and straw storage and fully-covered cattle yards should have economic lives of 20 years, that milking parlours of current design should have lives of 10 years, and that a forage tower silo should have a life of 15 years. But using these figures in any particular case may not show that the expected return covers

amply the annual charge. In the end the only test is that there should be a reasonable prospect of extra return resulting from the use of the equipment to be provided such that it exceeds the annual charge by a good margin. This will determine the economic life.

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The Ministry's Publications

Since the list published in the March, 1966, issue of *Agriculture* (p. 130) the following publications have been issued.

MAJOR PUBLICATIONS

Technical Bulletin No. 13. Soil Phosphorus (New) 37s. 6d. (by post 38s. 6d.)
Infestation Control. Report of the Infestation Control Laboratory for 1962-64
(New) 9s. 6d. (by post 10s. 1d.)

ADVISORY LEAFLETS

(Price 4d. each—by post 7d.)

- No. 47. Annual Nettle (Revised)
- No. 234. The Bullfinch (Revised)
- No. 245. Apple and Pear Scab (Revised)
- No. 247. Quality in Seeds (Revised)
- No. 461. Stem Eelworm on Tulips (Revised)

FREE ISSUES

- STL No. 50. Business Records (New)
(Guide for the completion of NAAS/NFU Farm Business Record Book).

The priced publications listed above are obtainable from Government Bookshops (addresses on p. 194), or through any bookseller. Unpriced items are obtainable only from the Ministry (Publications), Tolcarne Drive, Pinner, Middlesex.

Maurice Eddowes

Chemical Weed Control in Potatoes



PROFIT from potato production is proportional to yield of saleable ware. Rationalization of production provides a measure of price stability but introduces new problems. For example, acreage restriction may impose limits on scale and organization which make it difficult for the smaller-scale grower to meet the challenge of low unit cost of production as labour becomes dearer and scarcer.

This situation is reflected in Potato Marketing Board statistics for England and Wales in 1965, which show that 65 per cent of producers grew less than 10 acres each; 25 per cent grew 10-30 acres each; and 10 per cent grew more than 30 acres each. The contributions to total acreage were 20, 30 and 50 per cent, respectively, indicating that a mere 10 per cent of producers (with more than 30 acres each) grew half the total output.

The challenge

Chemical power is quietly replacing mechanical energy in weed control, a trend that may be desirable aesthetically if not biologically. Chemical weed control, however, should not be viewed as an isolated activity introduced with the sole purpose of replacing mechanical methods of weed control, but rather as a help to shape new farming practice. Traditionally, the potato crop is grown in wide rows to facilitate several successive post-planting cultivations. Most farmers consider that such cultivations are beneficial primarily for weed control, but also for soil amelioration, root development and prevention of greening of tubers.

Successful preliminary work on chemical weed control in potatoes, using dinoseb with TCA, was reported from Scotland in 1960. Since then many research workers and farmers have investigated the use of more active

chemicals such as diquat, linuron and prometryne. Chemicals have given effective control of annual weeds under a range of soil and climatic conditions and resultant yields of saleable ware have been similar, in general, to those obtained following standard cultivations. Sometimes, however, the relative yields of the two treatments have fluctuated by \pm 20 per cent. This evidence suggests that chemicals are alternatives to cultivations for weed control in potatoes, and that the farmer's choice may depend on cost and convenience. An essential proviso is that the decision must depend on weed flora, soil type, and the amount and distribution of rainfall.

The investigation

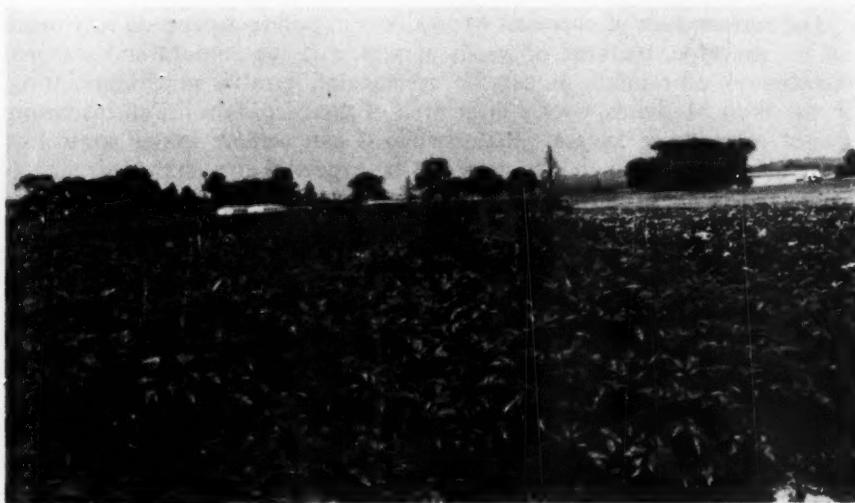
Several contact (foliar-acting), and contact and residual (soil-acting) herbicides were studied in field experiments at Harper Adams Agricultural College during 1963–65. Four experiments were carried out on light to medium sandy loam soils. A typical soil analysis is as follows: organic matter 3 per cent; coarse sand 37 per cent; fine sand 32 per cent; silt 14 per cent and clay 14 per cent. The soils, and the mean rainfall of 25 in. per annum, are typical of potato-growing areas of the West Midlands.

Herbieide applications were made with a precision sprayer at spray volumes within the range of 20–40 gallons per acre. Standard cultivations consisted of harrowing down ridges, one inter-row cultivation, and ridging-up. Weeds were assessed about one month after herbicide application.

Results

In three consecutive seasons, 1963–65, total and saleable ware yields of King Edward potatoes were similar following chemical weed control without cultivation and standard cultivations. Difference in weed control between herbicide and cultivation treatments, although often significant, did not affect final yields under the prevailing conditions. Typical results of the experiments at Harper Adams are shown in the table overleaf.

Chemical weed control in front v. weed control by cultivations behind. (Note fat hen on ridges)





Damage to King Edward foliage by ridging-up

King Edward potatoes—1965

Treatment	Weeds per sq. yd	Green tubers per plant	Average yield (tons per acre)	
			Total	Over 2 in.
Standard cultivations	23	0.16	18.45	12.40
Monolinuron	4	0.08	18.56	11.88
Dinoseb in oil	23	0.09	18.34	11.51
Diquat and paraquat	31	0.07	18.26	11.63
Prometryne and simazine	5	0.09	18.04	11.99
Prometryne	27	0.19	18.73	12.44
Ametryne	9	0.04	18.68	11.85
Linuron	6	0.12	19.77	13.59

The choice

The performance of chemical weed-killers in potatoes depends very much on the soil type, the kind of weeds present, and the amount and seasonal distribution of rainfall. It can be spectacular, erratic, or disappointing. In the West Midlands, over a large area of sandy loam soils, an increasing weight of evidence suggests that chemicals can achieve better control of most annual weeds than can normally be expected after standard cultivations, and that the choice of weed control method may simply depend on cost and convenience. At present the applied cost of contact weed-killers like diquat and dinoseb in oil, ranges from £2-£3 per acre, and that of contact and residual weed-killers like ametryne and linuron from £3-£5 10s. per acre. Standard cultivations will normally cost £2-£4 per acre, so that cost of weed control may not be the prime consideration.

The experiments at Harper Adams have shown that both chemicals and standard cultivations may depress yields slightly compared with hand-weeding. Chemicals are not growth stimulants and are therefore unlikely to increase yields directly. They may, however, lead to valuable fringe benefits due to frost protection and moisture conservation in undisturbed soils. Such

benefits are particularly attractive to the early potato grower. Post-planting cultivations may lead to root pruning, foliar damage, moisture loss and frost damage with subsequent reduction in yield.

When chemical weed control is examined as an integral part of a new farming practice the convenience factor may outweigh weed control cost considerations. As labour becomes dearer and scarcer the organization of the crop as a whole assumes paramount importance. Expenditure on weed control alone may be of little significance in relation to total production costs of £100-£120 per acre. Rapid but timely pre-planting cultivations to create a fine tilth ideal for both soil-acting weed-killers and mechanical harvesting, and elimination of post-planting cultivations, not only simplify production methods but also effect valuable savings in labour and power.

Perspective

It is estimated that the proportion of the potato acreage treated with chemical weed-killers increased from 1 per cent in 1963 to 5-10 per cent in 1965. The most spectacular advance occurred in some early potato growing districts where more than half the acreage was treated last year. At present chemical weed control has limited application. Soil-acting chemicals are less effective on heavy clay and peaty soils. None of the chemicals mentioned control couch grass which is the dominant weed in some potato growing areas, although contact weed-killers may give a useful check to its foliar growth. Cleavers, knotgrass, fumitory and some grass weeds show resistance to the present soil-acting weed-killers. Wind drift and late-germinating weeds may pose problems for the use of contact chemicals. Moreover, some growers may be uneasy about the use of chemical weed-killers, and public and user safety rightly demand careful screening and testing of materials. On some soil types, especially stronger land, post-planting cultivations may be desirable to improve tilth, especially in relation to mechanical harvesting, and the Dutch system described by F. E. Shotton in the January, 1966, issue of *Agriculture* may then be appropriate for weed control.

This article has been contributed by **Maurice Eddowes, B.Sc., M.Sc.**, who is senior lecturer in crop husbandry at Harper Adams Agricultural College, Newport, Shropshire.

The Royal Dublin Society

The Oldest Agricultural Society of All?

Henry Button

THE Royal Dublin Society is probably the oldest surviving agricultural institution of any kind in these islands. It is older, for instance, than Rothamsted and the *Farmer and Stockbreeder*, older than the Farmers' Club, older than the first Board of Agriculture. It is older than the Smithfield Club and the Bath and West Society, older than the Manchester Agricultural Society, older than the Wolsingham Show, older even than the Brecknockshire Agricultural Society and the Royal Society of Arts. In chronological order they run as follows:

Royal Dublin Society	1731	Royal Highland and Agricultural Society of Scotland	1784
Royal Society of Arts	1754	First Board of Agriculture	1793
Brecknockshire Agricultural Society	1755	Smithfield Club	1798
Wolsingham Show	(?) 1763	Farmers' Club	1842
Manchester Agricultural Society	1767	Rothamsted	1843
Bath and West Society	1777	Farmer and Stockbreeder	1843

The Smithfield Club was founded on 17th December, 1798, with Arthur Young as treasurer and secretary. It had its first show in 1799, at Wootton's Livery Stables, Smithfield. The Manchester Agricultural Society was founded in 1767 (as the Agricultural Society for the Hundred of Salford) and held its first show, in St. Ann's Square, in 1768; it now forms part of the Royal Lancashire Agricultural Society. The Bath and West was founded in 1777.

Other societies

The date of the first Wolsingham Show is uncertain. A recent show catalogue describes it as 'England's oldest Show'. Professor W. L. Burn, who was Chairman of the Wolsingham and Wear Valley Agricultural Society from 1947 to 1950, wrote a pamphlet entitled *How Old is Wolsingham Show?* in which he reached the conclusion that 'there was evidence to support the theory that the Show was founded in 1763 and reorganized in or about 1806', although he admits that 'the evidence is scanty and conflicting'.

The history of the Brecknockshire Agricultural Society has been told by Mr. Henry Edmunds in *Brycheiniog* (Vol. II, 1956, and Vol. III, 1957). In the first of his articles, Mr. Edmunds describes the Brecknockshire Society as 'the oldest of its kind still in active existence' but Councillor John de Winton, the President of the Show in the bicentenary year, describes it more accurately as 'the oldest Agricultural Society in the United Kingdom'.

The Brecknockshire Society, whose origins were closely linked with those of the Royal Society of Arts, was established nearly forty years before the first Board of Agriculture. Sir John Sinclair (1754–1835) was largely responsible for the creation of the Board or Society for the Encouragement of Agriculture and Internal Improvement, and he was President of the Board from its inception in 1793 until 1798 and again from 1806 until 1813. He was also one of the original members of the Highland Society of Edinburgh, which was founded at a meeting held at Fortune's Tontine Tavern in Edinburgh on 9th February, 1784; he was one of the four founder members to attend the jubilee celebrations in 1833, the formation of the Society having been first mooted in the year 1783. According to the *Dictionary of National Biography*, Sinclair devoted much energy to the collection of statistics, and the *D.N.B.* credits him with introducing the words 'statistics' and 'statistical' into our language.

The early years

The Royal Dublin Society had been established more than half-a-century before the Highland Society. The following brief history of the Society is based on two works to be found in the Ministry's library and on correspondence with Mr. Desmond Clarke, the Society's Librarian and Secretary. The first of the two works is the *Bi-Centenary Souvenir* of the Royal Dublin Society, published in 1931. The second is a short account of the life and work of Thomas Prior by Mr. Desmond Clarke, published in October, 1951, entitled *Thomas Prior 1681–1751, Founder of the Royal Dublin Society*. The latter work is particularly useful for its account of the founding and the early activities of the Society.

The *Bi-Centenary Souvenir* contains a number of articles on different aspects of the Society's history and activities. It also contains a number of advertisements, some of which have gained in interest with the passing of the years. There is, for instance, an advertisement for Fordson tractors stating that one of these had saved a peck of oats a day for each of five horses through two winters for a farmer in the east of England.

The Dublin Society, as it was originally called, was founded on 25th June, 1731, when fourteen men met in the rooms of the Philosophical Society in Trinity College and unanimously agreed 'to form a Society by the name of the Dublin Society for improving Husbandry, Manufactures and other useful arts'. Shortly afterwards 'Sciences' was added.

As the name indicates, the Society was much more than an agricultural society, but agriculture loomed large in its activities from the start. The first paper to be read and discussed at a meeting of the Society was a paper on a 'New method of draining marshy and boggy lands', which was presented by Prior at a meeting in September, 1731. The next meeting considered a paper on 'The best methods practised in Hampshire in the culture and management of hops'. Prior had strongly advocated the growing of hops in Ireland. The Society issued an edition of Tull's *Horse-Hoeing Husbandry*

in 1731; the first edition of Tull's book had been published, in London, earlier in the year. In the course of the next two years the Society issued booklets on beekeeping, flax growing, hop raising, and the cultivation of saffron.

In 1750 the Society received a charter of incorporation; the souvenir booklet contains photographs of this charter and of a subsequent charter of 1866. In June, 1820, King George IV became patron of the Society, which assumed the title of the Royal Dublin Society.

Annual shows

Although the Society had, at various times since its inception in 1731, brought together small displays of cattle and livestock, no attempt had been made to hold an annual show until 1800. Shows were held from 1800 to 1828 under the auspices of the Farming Society, and resumed, by the Royal Dublin Society itself, in 1831, after which date they continued as an annual event. The national show was run by the Royal Agricultural Society of Ireland, which was founded in 1840 and merged with the Royal Dublin Society in 1888. It was in 1881 that the latter society held its first show at the famous ground at Ball's Bridge, which had been acquired in 1880.

Scottish societies

There was at least one agricultural society founded before the Dublin Society, but it is no longer in existence. This was The Honourable the Society of Improvers in the Knowledge of Agriculture in Scotland, which was founded in Edinburgh in 1723 by certain noblemen and gentlemen. A brief history of the Society is given by Alexander Ramsay in his *History of the Highland and Agricultural Society of Scotland*, published in 1879. The Society gave advice to its members on ways of improving their lands and, in one reply to an applicant for advice, the Society referred to 'the Irish Society, set up lately in imitation of ours'. The Scottish Society does not appear to have survived the 'deluge' of 1745. J. A. Symon describes the Highland Society as 'the posthumous child of the Society of Improvers', although there was a gap of nearly forty years between the untimely end of the latter and the birth of the former.

There seems to be no evidence to support the contention that the Irish Society was set up 'in imitation of' the Scottish one. Mr. Desmond Clarke has pointed out that the Dublin Society differed in many respects from the Scottish Society in that it was not entirely devoted to agriculture, but had as its main purpose to improve husbandry, manufactures and other useful arts and sciences. It was therefore much more akin to the Royal Society of Arts, to be established nearly a quarter of a century later, in 1754. There was, according to Mr. Clarke, a certain amount of communication between the Irish and Scottish Societies, and it was indeed one of the purposes of these early agricultural societies to diffuse useful knowledge by communicating with similar societies in other parts of the country or abroad. The Dublin Society, for instance, was in communication with the Royal Society, the American Philosophical Society and a number of continental societies. In any event, The Honourable the Society of Improvers, having been defunct for more than two centuries, is in no position to challenge the present claim of the Royal Dublin Society to be the oldest existing agricultural society in the world.

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This article has been contributed by **Henry Button**, the Ministry's Principal Finance Officer.

UNIVERSITY OF CAMBRIDGE — 1966 SUMMER CONFERENCE

The theme of the 1966 Summer Conference at Cambridge will be 'Land and People'. The Conference will be held from 30th June until 2nd July, 1966, under the auspices of the Cambridge University Estate Management Club, Department of Land Economy and Estate Management Advisory Service, and the Chairman will be the Lord Howick of Glendale, Chairman of the Commonwealth Development Corporation and of the Nature Conservancy. Lectures will be given by Tristram Beresford, Professor J. N. Black, C. D. Pilcher, Professor Dr. E. W. Hofstee, Sir Richard Nugent and Dr. D. R. Denman.

Anyone interested in attending the Conference should write for full particulars to the Secretary, Estate Management Advisory Service, Kenmare House, 74 Trumpington Street, Cambridge. Accommodation will be available in Pembroke College.

Store Lamb Sales

A Study of Two Recent Sales

by H. Edmunds and J. B. Hill

As far as can be ascertained, the first sale of sheep at Honeybourne in Worcestershire was in 1863, when ten farmers entered stock which realized £840. It is probable that annual one-day sales (on 5th August) have been held ever since and progress has been impressive, certainly in the last fifty years.

Thus in 1909 there was an entry of 2,914 lambs; in 1936 there were 8,200 and by 1956 the number had risen to 18,501. Over the last seven years the total entry has fluctuated a thousand or so on either side of the 20,000 mark, and so there was nothing exceptional in the 1964 and 1965 events which are considered in this article. The numbers entered in these two years were:

	1964	1965
Lambs sold	21,993	19,838
Lambs unsold	528	1,219
Total	<hr/> 22,521	<hr/> 21,057

From a breed point of view, the sales were dominated by Suffolk crosses. There were pens of Hampshire crosses and a few white-faced lambs, but they were not many. Sexes were usually mixed in the same pen, but there were occasional pens of ewe lambs which their owners presumably considered to be potential breeding stock.

Vendors and purchasers

With the total entry in both years being very close together, little change in the vendor numbers was to have been expected. This was so, but there was quite a difference in buyer strength. The numbers were:

	1964	1965
Number of vendors	137	140
Number of buyers	203	161

There were 42 fewer buyers in 1965 than in 1964, and a fall of this magnitude might well have been partly responsible for the drop in prices between



Honeybourne lamb sale

the two years. But the number of lambs purchased per buyer was rather higher in 1965 than in 1964:

	1964	1965
Average entry of lambs per vendor	164	150
Average purchase of lambs per buyer	108	124

In both years, however, buyer strength was substantial and there seemed to be a reasonable balance between vendors and buyers. It is fair to assume that business was done by chance, and that there was no collusion between sellers and buyers. The operation of a 'free market' where neither side exerts special influence, apart from normal supply and demand, is obviously desirable.

In sales of this magnitude, lasting about 5 hours, some form of sampling technique is necessary. Thus in both years periods of approximately 15 minutes in every hour, drawn at random, were used as the basis for analysing price trends, number of bids, rate of selling and factors influencing these. The sales in both years opened at 11.10 a.m.; the 1964 event finished at 4.26 p.m. (total of 316 minutes), while the 1965 one ended at 4.20 p.m. (total of 310 minutes). It is worth noting that in each year only one auctioneer (Mr. E. G. Righton, Jnr.) officiated throughout the sales, in one continuous selling period.

Prices

During the six sample periods in 1964, which covered 6,827 lambs (30.3 per cent of total entry), the average selling price was £6 2s. 10d., compared with £5 15s. on 6,175 lambs (29.1 per cent) in 1965. There are several reasons which collectively may account for the fall of 7s. 10d. per lamb between the two years. The lambs may have been less well grown, although this did not appear to be so. It is more likely that there was less confidence amongst the buyers, due perhaps to the poor hay harvest and to the likelihood at the time of the sales of a difficult corn harvest. These factors, coupled with 42 less buyers than in 1964, combined to produce a less lively trade.

Bidding

Active bidding throughout a sale is an indication of buyer interest, although it does not follow that the more bids there are, the higher the final price. In general, it is expected that an auctioneer is aware of price trends obtaining elsewhere and, with this knowledge in mind, he tries to secure an opening bid as near as he can to what he believes the livestock is worth. Obviously, the fewer bids he has to take, the less exhausting his job becomes. During the sample periods at Honeybourne, the position was:

	1964		1965	
	Number	Range	Number	Range
Average bids per pen	6.4	6.0-6.8	6.7	5.8-7.2

Although there was little difference between the averages in the two years, the range was greater in 1965. At the beginning of the sale buyers were hesitant, and the number of bids was above average at 6.9 per pen. By the third period prices improved to £6 per head and the number of bids per pen dropped to average, but in the fourth period (2.0-2.15 p.m.) the average price fell to £5 14s. per lamb while the number of bids rose to 7.2 per pen.

In other words, there was a tendency for lower prices to be associated with above-average bid numbers. A good auctioneer, and Mr. Righton is one, has to be something of a psychologist. Regularity over too long a period induces a degree of boredom, and hence a falling off in concentration on the part of buyers; to overcome this, opening bids are occasionally requested at attractive prices. This breaks the monotony but it pushes up actual bid numbers.

Rate of selling

It is difficult to prove that the speed at which an auctioneer conducts his sale has any substantial influence on realization price. Presumably both extremes are bad: too slow a speed fails to retain buyers' attention whereas too fast does not allow them time to scrutinize the animals and also bid. But with about 20,000 head to sell in one day, and allowing adequate time before and after the sale for vendors' and purchasers' deliveries, it is obvious that the auctioneer should lose no time. And neither did he. Over the auctions as a whole, and not the sample periods, the position was:

	1964	1965
Number of pens	515	480
Selling time per pen	36.1 sec	39.5 sec
Pens per hour	99.7	91.1

The pace in 1964 was slightly faster than in 1965, due possibly to a better trade and a larger entry of animals. Speed is influenced to some extent by the size of entry: it gets faster when numbers are high and slower when they are fewer.

Selling time per pen is an important figure as it reflects two separate and distinct things. The first is the auctioneer's personal skill, and the second is a reflection of the organization and layout of the penning arrangements. In terms of time, it can be broken into two parts: (1) time actually spent taking bids (bidding time), (2) time spent moving from pen to pen (moving time).

The point is illustrated by the figures below which relate to the 1965 Honeybourne sale during the sample periods.

<i>Period (Av. of 14·5 min per period)</i>	<i>Bid time per pen (av.)</i>	<i>Moving time per pen (av.)</i>	<i>Total sale time per pen (av.)</i>	<i>Pens per hour</i>
	Sec	Sec	Sec	
1	23·3	12·2	35·5	101·3
2	21·2	11·6	32·8	109·5
3	20·6	16·2	36·8	97·7
4	23·0	12·1	35·1	102·3
5	20·0	13·0	33·0	109·1
6	18·9	18·1	37·0	97·2
Average	21·1	13·8	34·9	102·8

It will be noted that there is a discrepancy between the sale time per lot for the whole auction (39·5 sec) and the sample periods (34·9 sec) which is reflected in the number of pens sold per hour.

During the sample periods, however, it will be seen that the average sale time per pen was 21·1 sec (60 per cent) and the moving time 13·8 sec (40 per cent). The moving time figure is interesting. The auctioneer and buyers moved from pen to pen without any delay, but the bulk of the 40 per cent was taken up by turns at the end of each block of pens. Although the moving time figures appear high, there is no doubt it was cut to the bone and no improvement could be suggested. With the existing pen layout it was unavoidable.

The sort of analysis made in this study, crude though it might be, is a forerunner to what might be described as 'auction management'. As there is no alternative form of marketing for store animals other than private sale, it is highly desirable that auctions should operate efficiently. The procurement of yardsticks must await the outcome of a much greater number of analyses, but it is tentatively suggested that 80–100 lots per hour, with an average of 7–8 bids per lot, is an indication of a well-run sheep sale, when the animals are sold in pens.

The Honeybourne sales are far more than a colourful agricultural scene. The calm, unflurried but speedy way in which the sales were conducted was most impressive. And it would be hard, at this point in time, to think of a better method of price determination.

This study was made possible by the kindness and encouragement of Mr. E. G. Righton, Jnr., M.C., F.A.I.

The joint authors of this article are **Henry Edmunds, B.Sc.**, who is County Advisory Officer, N.A.A.S., Warwickshire, and **J. B. Hill, N.D.A.**, who is a N.A.A.S. District Adviser in Warwickshire.

A.L.S. RENT ENQUIRY

Farm Rents in 1965

THE increase in farm rents in England and Wales continues at about the same rate that has prevailed since 1961. The latest enquiry by the Agricultural Land Service discloses an average increase in the year ending October, 1965, of 7·25 per cent, compared with 7 per cent in each of the previous two years and 8 per cent before that. As a result of these increases, rents are now almost a third higher than they were four years ago.

The average rents per acre of crops, grass and rough grazing obtained from the enquiry are as follows:

	<i>October, 1964</i>	<i>October, 1965</i>
	£ s. d.	£ s. d.
England	3 11 0	3 16 0
Wales	1 16 6	1 19 0
England and Wales	3 6 0	3 11 0

The estates covered by the survey comprised about 20,000 farms which, together with County Council smallholdings in the sample, accounted for 3½ million acres, some 27 per cent of rented farmland in the country.

Land classification

Previous articles in this series have given some indication of the variations in rents which are concealed by these average figures. The 1965 enquiry provides new information which throws some light on the effect of land quality on rental values. Landowners and agents were asked to divide the estates for which they gave figures into three classes: upland, lowland and mixed. Upland and lowland are, of course, rather general terms and mean different things from one part of the country to another. They relate for the purposes of the enquiry to the range of altitude and local conditions found in each region and not to standard definitions for the whole country. Subject to this qualification, the extent to which the quality of land in these different areas is reflected in average rent levels is indicated in Table 1.

It is clear from these figures that there are four separate situations in different parts of the country. In the Eastern region the word upland is sometimes used but it generally refers to arable land very little higher and of no less value than the surrounding lowland. Moving southwards and westwards,

Table 1

Average rent per acre* of crops, grass and rough grazings at mid-October, 1965

Ministry of Agriculture region	Predominantly upland estates	Predominantly lowland estates	Mixed upland and lowland estates	All estates*
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Eastern		4 10 0		4 12 0
South-Eastern	3 13 0	4 9 6	3 15 6	4 5 0
East Midland	3 12 0	4 3 0	3 6 0	3 19 6
West Midland	3 0 0	4 15 0	3 17 0	4 11 0
South-Western	2 16 0	4 6 0	3 11 0	3 18 0
Northern	13 6	3 9 0	2 3 0	2 3 0
Yorkshire and Lancashire	17 6	3 19 6	1 18 0	2 19 6
Wales	17 0	2 18 0	2 3 6	1 19 0
England and Wales	1 16 0	4 3 6	2 15 0	3 11 0

*The figures for 'All estates' are averages of the counties in each region weighted by the total rented acreage in each county. Those for the separate categories of estate are derived from acreages and rents in each county in the sample only.

the differentials between upland and lowland rents become progressively wider as the local definition of upland alters to take in such land as the chalk downs and then the fringes of the western hill areas and the moors of Devon and Cornwall. In the true hill and mountain land of Wales and the north of England the higher land is largely rough grazings and the average rents well reflect the low output per acre they can support.

This broad classification explains some of the major differences in average rents in different regions. The range of average rents on lowland estates from one part of the country to another is narrower than the range of rents for all estates, although even on lowland estates the range still reflects the differences in definition and land-quality between the east and south-east of England and the rest of the country. In only five counties (all but one of them in Wales) does the average rent recorded for lowland estates fall below £3 per acre, compared with three times that number on the basis of all estates irrespective of altitude.

New rents in 1965

More detailed information about rents of individual farms comes from a slightly smaller sample of some 18,500 farms* (other than C.C. small-holdings). The new rents fixed since October, 1964, on nearly 4,000 of these farms, according to the type of rent change, are shown in Table 2.

Table 2

Average rents per acre by type of rent change

Type	% of sample farms	% of total acreage in sample	October 1964	October 1965	% increase
			£ s.	£ s.	
New tenancy —by tender	0.3	0.3	3 18	7 16	99
—by agreement	2.5	2.6	3 9	4 11	32
Sitting tenant—by agreement	17.2	21.7	3 8	4 6	25
—by arbitration	0.1	0.2	15	1 5	67
All farms with a change in rent	20.1	24.8	3 9	4 7	26
Farms with no change in rent	79.9	75.2	3 11	3 11	0
All farms in sample	100.0	100.0	3 11	3 15	6.5

*This sample had a higher rent and a slightly smaller percentage change than the complete sample of estates.

As in 1964, the average rent change for farms showing change in 1965 was of 26 per cent; rents fixed for new tenants by tender again produced the largest proportionate increase but only a very small proportion of farms were let by this method. Regional variations in new rents by agreement are shown in Table 3.

Table 3

Average rents per acre at mid-October, 1965, on farms with a change of rent since 1964

Ministry of Agriculture region	Rents agreed with new tenants*			Rents agreed with sitting tenants		
	Average size of farm (acres of crops grass and rough grazing)	Average rent	Per cent increase over previous rent	Average size of farm (acres of crops grass and rough grazing)	Average rent	Per cent increase over previous rent
Eastern	267	4 9	25	279	4 17	28
S. Eastern	243	4 11	19	233	4 16	26
East Midland	198	5 4	37	229	4 14	26
West Midland	101	5 11	48	155	5 3	24
S. Western	232	4 17	26	185	4 5	26
Northern	177	2 14	45	250	2 6	27
Yorkshire and Lancashire	134	4 9	32	156	3 18	18
England	186	4 13	30	207	4 8	25
Wales	97	3 11	44	127	2 14	31
England and Wales	169	4 11	32	199	4 6	25

*Excludes new rents by tender

These new rent agreements, as distinct from rents by tender and by arbitration, account for the vast majority of all rent changes in any year. The general pattern is similar to that shown in the 1964 survey, although changes in the samples prevent any precise comparison. Rent increases agreed with sitting tenants are generally smaller than when rents change hands.

About one in fifty of the new rents recorded in the enquiry were of £10 per acre or more. These were mainly for farms of less than 25 acres which, as has been remarked in earlier articles, generally have the highest average rent levels. It is noticeable, however, that the five per cent of new rents fixed at between £7 10s. and £10 per acre were fairly evenly distributed over all farm sizes up to 500 acres. Most of these high rents were in the Eastern region and the Midlands, and reflect the relatively high fertility and profitability of farms in these parts of the country.

Farming Cameo:

Series 3



39. West Radnorshire

W. Scragg

THE western district of Radnorshire is an area of unspoiled natural beauty. Included in the district is that part of the county north and west of a line from Newbridge to Llandrindod Wells, and thence north along the Newtown road to the Montgomeryshire border. The beauty of the mountain scenery found in the upper Elan and Wye valleys is well known to tourists. Luckily it is still uncommercialized. The Birmingham Water Corporation owns the mountain watershed surrounding the Elan valley together with the four large reservoirs. Agriculture here consists of large hill farms sparsely placed. Such farms have resident flocks of up to 1,000 Welsh Mountain sheep occupying the open hill, and small numbers of beef-type cattle are kept in the enclosed areas which surround the homesteads. Hill farms of a similar type are found in the upper Wye valley. The upland areas surrounding the villages of Nantmel, St. Harmon, Pantydwr, Bwlchysarnau, Abbeycwmhir, Llananno and Llanbadarn Fynydd also hold in their confines scenery of great beauty. A mixture of pine forest, bracken hill and a patchwork of grass fields provides immense satisfaction to the aesthetic eye.

The height of the district above sea level ranges from 600 to nearly 1,800 feet. The rivers Wye, Elan, Ithon and Marteg drain the waters from the hills. The annual rainfall is in general over 40 inches, and in some parts up to 80 inches. This keeps the water-flow in fair spate over much of the year.

Over most of their reaches the rivers are the haunt of trout and salmon and the annual migration of the latter up-stream attracts some unlawful attention.

The predominant soil types are silty loams and silty clay loams. These are stamped with characteristics derived from the underlying Silurian shale. Pedologists recognize four soil series: starting on the hill top with the Powy and ranging downwards to the valley bottom through the Penrhyn, Sanon and Cegin series. The first two are freely-drained, light soils while the latter are imperfectly or badly drained heavier-type soils. The order of light to heavy from the hill top to the bottom land is not invariable. In some cases heavy silty clay is found underlying peat on the upland plateau, while lighter soils exist in the valley base. All the soils are naturally deficient in lime and very low in available phosphate. Basic slag is almost universally used on this land. Lime must also be used, but in over-generous quantities it tends to produce trace element deficiencies. Boron deficiency in swedes, turnips, and mangels is sufficiently widespread to warrant mass propaganda advising its application to all root crops. Grey spot in oats is noticeable and in many cases manganese spray applications have been beneficial. Cobalt deficiency in grass and in winter fodder is receiving increasing attention as a direct or indirect factor that can affect adversely the health of cattle and sheep.

The farming of the district is predominantly cattle and sheep rearing. The cattle are in the main Hereford or Hereford Cross but there are a few herds of Welsh Blacks. The sheep are Welsh Mountain on farms with open hill runs. Hardy Speckleface are kept on the more exposed upland enclosures with larger Kerry and Clun crosses and sometimes pure Kerrys in the bottom land enclosed farms. Excluding the open hill area, the average 100-acre farm is typical of the district. It carries 11 beef cows with 16 followers, as well as 100 ewes and 30 ewe hoggs. Such a farm is a one-man family concern, capable of giving a profit of up to £1,000. The farm is largely self-sufficient. Hay, oats on the sheaf, and roots are grown for winter feed, and only a small amount of purchased feed is used.

Since stocking density is low, about 2 acres per livestock unit, there is scope for intensification. Some expansion in numbers is taking place, but the ultimate possibility will demand a radical change in the mental outlook of the farmer. Better grassland management coupled with a conservation policy based on silage and with a much higher usage of nitrogen is being encouraged. Much good land has been, and is being, reclaimed from rough hill. The results achieved by ploughing, liming and slagging, and reseeding, are in many cases remarkably good. First-class pasture is produced either by a direct reseed or by pioneer cropping and then reseeding.

The picture in West Radnorshire is that of a community of small family farms. They are run by farmers who are highly skilled in stockmanship, perhaps rather tradition-bound, but nevertheless very intelligent. Their response to help and advice is quick and warm. It is a continual pleasure and a source of immense satisfaction to work among them.

FROM THE ALS

A. F. BAINES

*Agricultural Land Service,
Harrogate*

The Appearance

of Farm Buildings

IN an age in which efficiency is valued above everything and any aesthetic consideration is regarded as slightly eccentric, the British countryside has so far managed to weather the onslaught of the Farm Improvement Scheme. Whether or not a farm building looks right, is, and always will be, a matter of personal judgment. But this is not to say that, in principle, appearance takes care of itself—in this, at least, all women will agree—and if the appearance of farm buildings is ignored and weight is given only to functional considerations of use and construction, then in due course this generation will be able to claim that it helped to destroy the most beautiful countryside on earth. Before this happens, and to prevent it happening, everyone concerned with farm buildings—farmers, advisers and landowners alike—should give some thought to the following aspects.

It is normally a mistake to try to hide a new building. Firstly, because the disguise is rarely successful—roofs that are painted green, screens of trees, and so forth, tend to attract attention. Secondly, a well-designed building is an aesthetic asset, rather than a liability. New buildings are also an indication of vigorous and prosperous farming. Surely the worst impression that can be given is that of a stagnant industry, bereft of new ideas, existing in some forgotten age, and such an impression will be fostered by the concealment of new investment.

But for today's farmers and building designers there are new problems. In times past building materials were of local origin, e.g., the use of locally-quarried stone, and by their nature these materials were in harmony with their surroundings. Not only was there a continuity in the use of materials but also in the craftsmanship employing them. Builders operated in limited areas, and villages and farmsteads within their spheres had a pleasing uniformity which was never on a sufficient scale to become oppressive. The contribution, too, of the large landowners was far-reaching in the last two centuries, when they were responsible for so much of the best in rural architecture. New building techniques have caused a quiet, yet obvious

revolution. Now, most of the new farm buildings are supplied by firms many of which operate on a national basis and specialize in framed structures using steel, precast concrete or timber. There are those who dislike the appearance of all such buildings, particularly singling out for criticism the large areas of asbestos or corrugated-iron sheeting which they commonly present. This criticism, by no means accepted by all, underlines the extra care that should be taken in planning layouts incorporating these buildings. The danger which they present lies in their uniformity.

Designers have so far failed to take up the challenge of avoiding drab similarity. The shape of things to come will be better if a more imaginative approach is used to such matters as siting, the use of alternative materials to achieve contrast, and the shape of individual buildings. The worst enemy of good design is a piecemeal approach to farm development. Any attempt at long-term planning is better than none at all, and there is little chance of achieving the ordered layout which is desired by everyone unless there is strict adherence to the discipline of planning.

There is a well-known saying that new wine and old bottles are best kept apart. This should be borne in mind when new buildings are proposed for a farmstead. Frequently the site which they are to occupy is adjacent to existing buildings and almost as often the resulting group of buildings is an aesthetic mess, far worse than the original. If there is no choice in the siting, as may be the case, at least attempts should be made to marry the new with the old by providing some sense of continuity.

The designer can consider himself fortunate when he has a clear site in which to work. In these circumstances new farm buildings can look particularly pleasing. There is a functional, uncluttered quality about them in which a landowner can take pride. It follows that wherever possible new framed buildings should be sited apart from old buildings so that they can be looked at either singly or in groups without older structures impinging.

But new buildings are only a part of most farmsteads. Older structures, often neglected since before the years of agricultural depression, can give an impression of decay and obsolescence which may be at odds with the useful functions they perform. If a building is necessary, it is worth keeping in a good state of repair. If it is not needed, it should be demolished. There is a tendency to avoid demolition so that the residual value in a building which is no longer considered worth repairing can be realized; in this process appearance is the first to suffer. The economics of this policy cannot be defined in accurate terms, but the disadvantages are obvious. As the years pass the building becomes increasingly less suitable for its purpose as it becomes less weatherproof, and ultimately it deteriorates to the point where its state is dangerous to both man and stock. There are, of course, several arguments in favour of the regular maintenance of buildings apart from the simple question of their appearance. It is sufficient to point out that unless buildings are kept in repair they will be unattractive.

Aesthetic considerations are thus as important as others to bear in mind where farm buildings are concerned. The main purpose of this article will be served if it proves the means of stimulating the interest in this aspect amongst those readers concerned with the siting and design of such buildings.



Modern Aspects of Animal Production.
N. T. M. YEATES. Butterworth, 1965.
90s.

This work is based on four courses of lectures given by the author to senior undergraduates in livestock husbandry and forms a most valuable reference and text-book for students having basic biology and physiology training.

Part I, dealing with reproduction, discusses at length the actions and effects of the hormones of reproduction; the effects of plane of nutrition, age and season of birth on female reproduction and the breeding season; semen, fertilization and pregnancy. Factors contributing to reduced fertility are considered separately for male and female. A.I., out-of-season breeding, hormone-induced multiple ovulation and twinning are discussed as means of increasing fertility and fecundity.

In Part II, 'The Influence of Climate', valuable treatment is given to the subjects of heat and cold, thermal adaptation, the combined effects of cold, wind and rain, evaporative cooling, sweating and sweat glands. The important characters of coat and skin are covered extremely well, especially where these characters are related to production factors, evolution, or as in the red pigmentation of eyelids in beef cattle and the resistance to eye cancer. A well-reasoned case on the selection of livestock for hot climates leads to a discussion of the effects of climates on reproduction.

Meat forms the subject of Part III. The beef carcass is discussed from preparation, cutting, and proportional distribution of cuts in the carcass, to the ratio of bone, muscle and fat, each of these tissues being fully dealt with in fundamental terms. Meat quality, including tenderness, colour and flavour, is examined and carcass appraisal described through a method devised by the author (carcass

fleshing index), as well as by visual judging and scorecard appraisal. Mutton and lamb carcasses, their quality and appraisal are treated separately.

Part IV is concerned with wool. It reviews the biology and histology of wool fibre, measurement of fibre characteristics, the physical and chemical properties of wool and, in the last chapter, discusses fleece improvement through nutrition, genetics, and fleece testing. Mostly based on Merino and Romney fleece work in Australia, this chapter nevertheless has wide reference and application to conditions in this country.

Written throughout in very readable language, with a strong practical application in all the reasoned discussions, this somewhat unusual grouping of subjects, all vital in the field of livestock production, should prove to be of immense value to students of all ages as well as to the more scientifically-minded of the leading practising livestock farmers.

The text is liberally supplied with references and these are fully collated. The index, too, is an invaluable guide to the text.

T.T.

Beneficial Insects. LESTER A. SWAN.
Harper and Row, 1965. 60s.

It cannot be denied that the use of modern pesticides has led to a tremendous saving of crop losses. But neither can the warning signs be ignored that such relatively crude weapons offer no permanent solution to pest control problems. Living organisms are too richly versatile to be so easily defeated. Not only is there now anxiety about the worldwide contamination of land and water with persistent pesticides, and about the consequent harmful effects on wild life, but there is also the development of resistance to these chemicals by many important pests, and the appearance of new pests due to disturbance of natural checks. Some of the chemicals have set problems even more difficult than those they had appeared to solve.

Other and more subtle means of circumventing damage by pests, with or without the use of chemicals, will have to be devised. These will include a fuller understanding and use of the great variety of natural agencies which normally regulate insect numbers. Knowledge of these agencies has been brought together

in an authoritative yet most readable way by Lester A. Swan in *Beneficial Insects*. With fascinating accounts of life histories and habits, he describes examples of the principal insect parasites and predators, predation by spiders, mites, amphibians, reptiles and birds, and the diseases of insects caused by fungi, bacteria, viruses and eelworms. There are also chapters on aquatic insects important as scavengers and food for fish, and pest control by means of lures, traps, release of sterilized males, resistant crop varieties, and various other cultural devices. The illustrations are good, and there are glossaries of technical words and the classification of insects and allied creatures.

The author documents the many ventures in control of pests by introduction of parasites and predators, and gives an appendix summarizing the results of those attempted in Canada, the North American continent and the Pacific area. Taking a balanced approach, he also discusses the integration of biological control with a selective use of chemicals. Biological control is not pushed as the only and final solution, but as a method which will help to provide a variety of strategies to meet the varying problems posed by nature, and urgently needing more research.

Although this book refers mainly to the North American continent, it is designed as a popular work intended to stimulate the wider approach as opposed to the merely chemical one. Its message should be heeded by all those whose work is with the control of pests, especially those who have to decide research policies.

B.D.M.

Pesticides and the Living Landscape.
ROBERT L. RUDD. Faber and Faber, 1965. 35s.

Rachel Carson's *Silent Spring* was a work of advocacy rather than of scientific detachment, and though it served its purpose in drawing public attention to the hazards of modern pesticides to wildlife, many who read it felt that a proper scientific appraisal of the subject was also needed. This Dr. Rudd has now provided.

His primary aim was to assess the various kinds of hazard in the 'living landscape' resulting from chemical pest control. Having first defined the nature of the

chemicals involved and the varied uses to which they are put, he discusses justification for pest control in terms of loss and gain, including assessment of the adverse effects on wildlife. Later chapters deal, among other things, with pesticides legislation, the responses of invertebrates and vertebrates to chemical control, sub-lethal effects, the development of resistance to insecticides, prey-predator relations, repellents, pesticides residues in soil, food and living tissues, and the significance of pesticides in food chains.

The situation described is essentially that occurring in America, but this has its advantages for the British reader. There are wide differences in pesticide usage in the two countries, as Dr. Norman Moore points out in his foreword to this English edition. In particular, the frequent blanket or mass spraying of extensive urban and forest areas carried out in North America under government control and quarantine programmes, has no real counterpart in this country. Yet it is just from these controls—which are very critically examined—that illustrations of the more devastating effects of pesticides on wildlife are drawn. In some instances the position may well be worse than it appears, because losses of birds from chemicals have drawn a disproportionate amount of attention. Legislative and advisory preoccupation with pesticide residues in marketed foodstuffs is thought to have grossly distorted the real problem of residues in a much wider context.

It is argued that good pest control should not begin with a toxic chemical and work backwards to the pest. The approach must be an ecological one, starting from the pest. The steady drift over the past twenty years away from the fundamentally biological nature of pest control and towards chemical control must be reversed. Chemicals have their proper place and must continue to be used at times along with cultural and biological practices in an integrated programme which also avoids single-minded attention to target species. Where other methods are not available, chemicals can be used to buy time enough to work out effective and permanent solutions to pest problems. To this end a number of specific recommendations are made in the final chapter.

The text is well documented, with over 300 references to the relevant literature, including a substantial number of non-American contributions. Every page of this book bears the stamp of authority.

W.C.M.

Big Men, Little Men and Men in Between.
ROBERT C. KEEN. 1965.

This is a different book. It is late at night. You have eaten a huge and rich dinner. You are almost prone in an old easy chair, a comfortable drink is a hand's reach away, the room is full of tobacco-smoke, there is an embered fire to stare at. Mr. Keen talks. You just listen.

Robert C. Keen obviously intended never to conform. He was convinced, very early on, that there were ways of earning a living much more exciting and rewarding than following the general pattern. His book is the story of his explorations in this direction and of his successes and failures. It matters little that he ended where he began—back in the general pattern. In between he had his battles and his fun in being himself.

Mr. Keen joined the population in 1908 in a farmhouse in Oxfordshire. He begins to record his remarkable memory on the first page of his autobiography and he is 'off'. He sketches his schooling, from a governess to Shaftesbury Grammar School, where he finished his 'wasted years of schooling!' Up to twenty years of age Mr. Keen worked on the home farm. Then he sailed for Australia. His ability to record detail is especially useful because the reader will want for nothing in information. Mr. Keen makes incidents and people real and everyday. He enjoyed it all and makes us partake of his adventure.

He was a pioneer in the beginning of the transfer of heavy work from man to machine, and he tore into the hazardous occupation of contracting to do land-clearance and ploughing. Like many of his contemporaries he found many flints on the way. His problems and his methods of solving them, mental, physical and mechanical, were, typical of their day, make-do and mend. These were the days for men with drive, and drive he certainly did.

In 1933 Mr. Keen returned to England, but with a difference. Here was a man who had been through the rough. He was impatient for action and full of energy and ideas. He had, also, a non-failing supply of will to 'have-a-go'. After farming again, Mr. Keen, in full pursuit of one of his ideas, and using his experience of design and manufacture in emergency, built up businesses in contracting and in making farm trailers. Once more he learnt by trial and error, and he knew every variation in luck and fortune.

If you regard Mr. Keen's book as an agenda, the main items for discussion are important and of great interest. It is his ability to take you with him every detailed step of the way, however, that is so fasci-

nating. There are details you would not normally expect to find in a book, and it is quite a surprise to close the book and realize that you have been reading Mr. Keen and not listening to him. He has much more to say and there must be enough for another book. I know he will enjoy writing it and his readers must look forward to its advent.

Copies may be obtained from Mr. R. C. Keen, Manor Farm, South Weston, Tetworth, Oxon. 30s. (including postage).

T. A. McD.

The Veterinary Annual 1964-65. Edited by
W. A. POOL. John Wright and Sons,
1965. 63s.

The sixth issue of the Veterinary Annual will provide a most valuable addition to the shelves of the busy veterinary surgeon and, in fact, to all who are interested in the rapid advance of veterinary science.

The first ninety pages are largely devoted to articles on the new veterinary developments which are associated with the changes in various branches of stock-keeping. Also included are articles on 'scent'—a stimulating contribution—the promising prospects of the veterinary clinical observation unit, a thoughtful assessment of the problem of worms in sheep, and an appraisal of livestock insurance.

The main section of over 250 pages is devoted to a review of recent literature. This is very comprehensive and rests on the majority of the 3,000 references which occur in the book. Its 13 chapters, in addition to diseases, cover reproduction, poisons, radiation, physiology concerning control of body temperature and the effects of climate, and a well-illustrated account of developments in surgery. The article on pharmacology and therapeutics succinctly summarizes recent progress and carries a useful appendix of synonyms of the various drugs which have been mentioned.

A volume such as this, with its 39 contributors, each expert in his own field, makes great demands on the editor. Mr. Pool can rightly be proud of the success of his efforts, and particularly of the excellent index.

The Veterinary Annual not only holds its place as an authoritative reference book; it is also one in which a veterinary surgeon can browse with pleasure for his profitably spent three guineas.

J.W.R.P.

The Wood-pigeon. R. K. MURTON. Collins, 1965. 25s.

This is a very important book which deserves wide circulation among country people and farmers in particular. Such species as the wood-pigeon, which can be seen to do no good and which are so conspicuously numerous, raise the hackles of the farmer, so that the resulting emotional attitude clouds the issues involved in both the assessment of the damage they do and the design and application of preventive action. Dr. Murton, in this account of many years' careful study of the wood-pigeon by himself and his colleagues in the Ministry of Agriculture, has tackled both these aspects with a cool head and a clear eye, and the scientific approach to both problems is ably presented.

After an introductory section on pigeons in general, nine chapters are devoted to a thorough biological appraisal of the wood-pigeon in Britain. The final two chapters are concerned with the types and amount of damage caused by pigeons and methods of limiting this damage. This balance of material gives some idea of the amount of basic biological study that is necessary before a sound assessment of the situation and ways of controlling it can be made.

The biological chapters of the book are impressive and contain a great deal of essential basic fact and interpretation. Many ideas are put forward: some well-established, others still requiring proof. This section makes an important contribution to the understanding of the 'natural' regulation of animal numbers, and animal ecology generally. Most of the facts were collected in East Anglia, and while many will be at least broadly applicable in other parts of the country others, such as the strong dependence of the birds on spilled grain and clover in autumn and winter, may vary from place to place according to local agricultural practice and crops.

The recommendations on control methods will probably be the most controversial, but the argument is very convincing. The calculations presented in chapters 8 and 12 clearly show that to achieve and maintain a reduction in the national wood-pigeon population would require a much greater shooting effort than is normally mounted, and the timing is critical. To attempt this is unrealistic and quite uneconomic, and the emphasis is firmly placed on local protection of valuable crops at vulnerable stages.

The book is well produced and beautifully illustrated with the author's photographs. A minor criticism is that the text figures are often unnecessarily complex for a work of this type, and sometimes difficult to interpret. Several misprints were noted—an important one on page 142, where 0·36 per cent should read 36 per cent. At 25s. this book is very good value, and contains much to interest and inform countrymen and biologists alike.

G.M.D.

Insect Sex Attractants. MARTIN JACOBSON. John Wiley and Sons, 1965. 60s.

It has been known for a long time that insects produce chemical substances that influence the behaviour of other insects of the same and sometimes other species. Pheromones, as these chemicals have been named, include the sex attractants, substances that are produced by one sex and elicit a response in the other or sometimes both sexes. They result in the attraction of males to females, the excitation of females in the presence of males, and the aggregation of individuals of both sexes. It has not been overlooked that the properties of these chemicals might be utilized in pest control, but it is only comparatively recently that research on this subject has been greatly increased, mainly in the United States. This book reviews knowledge on the subject as a whole.

Pheromones occur in nature in extremely small quantities and recent advances in our knowledge of them have been much facilitated by the development of a number of highly-sophisticated techniques in chemical analysis leading to their isolation and characterization. Dr. Jacobson has been in the forefront of this work and his book is, therefore, especially welcome. It is a review that will be particularly useful in providing a broad introduction to the subject for the student and the research worker, who will welcome it also as a source of reference: there are 427 references that appear to cover the subject thoroughly. The book is, however, probably too specialized for most readers of *Agriculture*.

Chapter 1 is a short introduction to the subject; chapters 2-4 draw brief but comprehensive attention to the occurrence and demonstration of sex attractants in females, males and both sexes (assembling scents) of approximately 200 species of insect. Succeeding chapters deal with the

anatomy and physiology of the production glands; the mechanism of attractant perception; the influence of age of the insect on production and response to sex attractants; the influence of time of day on production and mating; collection, isolation and identification; synthesis and use in insect surveys and control. There is a workmanlike index. The book is well produced and likely to prove good value for money.

F.H.J.

A Bibliography of Farm Buildings Research. Part III—Buildings for Poultry, 2nd Supplement, 1962-64. Agricultural Research Council, 1965. 9s. (by post 9s. 6d.).

Do you know how long a laying hen spends on the nest? Seven per cent of her time—or at least she does in Minnesota. Two research workers at the Nutrena Research Farm there also found that she rested 55 per cent of her time, was eating for 21 per cent of it and spent 7 per cent of it drinking. As this adds up to only 90 per cent of her time, one is left with the intriguing question of what she did with the other 10 per cent. This is rather a light-hearted presentation of item 92 in this Bibliography, which contains 403 references.

On a more serious note, item 130 gives an account of work at the National Institute for Research in Dairying at Reading. There it was found that although chicks reared in germ-free tanks gained more weight than chicks in a conventional environment, the individual variance was similar in both lots. This shows that environment alone will not even-out physiological differences, and is a pointer for the physiologist and the geneticist.

These two items are taken almost at random from a large, world-wide collection of research work in brief. It may be thought that with broilers, turkeys and now laying hens becoming big business, research of this kind has restricted value. This is not so; there are still many small-scale poultry keepers relying on advisers to guide them, and this Bibliography has special value to advisory workers and researchers as well. And when the day dawns, if ever it does, that poultry keeping is in only a few hands, then the research work will be of even greater importance.

C.R.

Game on the Farm. ELEY GAME ADVISORY SERVICE BOOKLET No. 20, 1965.

Although described as 'a digest of game management—European edition', the compilers of this booklet have relied heavily on British experience. However, there is mention of some interesting news from other countries and particular reference is made to Dutch methods of wildfowl conservation; these are well described and clearly illustrated. Dutch ideas for winter feeding of game birds also seem practical and effective.

The principle on which the booklet is written is that more farmers could enjoy better sporting on their land without undue interference with their ordinary husbandry practice. Where natural conditions for wildlife are good, encouragement of nesting and rearing may be unnecessary, but where conditions are less suitable a great deal can be done if advice is followed. In any case, it is important to maintain the right conditions for game to thrive and this means a sufficient supply of food, water and shelter. The valuable point is made that on a small shoot it is good sense to reduce avoidable casualties by taking precautions to prevent injury to game during agricultural or forestry operations.

Like the other publications in this series, it is well produced, clearly illustrated and very readable. Just the thing for a winter evening.

The booklet may be obtained free of charge from Eley Game Advisory Service at Fordingbridge, Hampshire.

R.G.A.L.

Books Received

Soviet Agriculture: The Permanent Crisis. Edited by Roy D. Laird and Edward L. Crowley. Pall Mall Press, 1965. 50s.

Rural Science. Book 5. G. R. Moore. Cassell, 1966. 7s. 6d.

British Fruit Farming. R. R. W. Folley and W. L. Hinton. Farm Economics Branch, School of Agriculture, Cambridge. 1966. 8s. 6d. (including postage).

United Kingdom Dairy Facts and Figures, 1965. The Federation of U.K. Milk Marketing Boards. Copies from The Milk Marketing Board, Thames Ditton, Surrey. Up to four copies 7s. 6d. each. Five copies or more 6s. (including postage.)



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OFFICIAL APPOINTMENT**UGANDA**

The successful government-owned but independently-operated Uganda Development Corporation has vacancies for the following senior staff:

Industrial Projects Evaluation Officer

To carry out the evaluation of industrial projects either in new enterprises or by the expansion of existing subsidiary companies. Applicants, preferably economists or with financial qualifications, should have experience of project evaluation in a diversified industrial concern. Salary range £3,000—£3,500 per annum.

Agricultural Projects Evaluation Officer

To carry out the evaluation of new agricultural projects. Applicants should be agricultural economists with ability to present figures in lucid form. Experience of livestock development and/or tropical agriculture would be an advantage. Salary range £3,000—£3,500 per annum.

Both posts would be for a minimum contract of two years. Free housing accommodation and medical benefits provided.

Candidates should write to:

Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

giving a summary of personal details including *full* name, and quoting reference RC. 284/183/04.

OFFICIAL APPOINTMENTS**PLANT PATHOLOGIST
MALAWI**

Required to identify diseases of crop plants and to undertake advisory work on control measures, including some research work into those diseases of major importance.

Candidates should hold an honours degree in natural science with plant pathology or botany as a major subject. Some post-graduate work in plant pathology is desirable.

Salary: £1,485—£2,600 a year plus 25% terminal gratuity. Passages provided. Education allowances. Government quarters. 2-3 year contract.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details, giving full name and brief particulars of qualifications and experience, quoting RC 213/134/010 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**AGRICULTURAL OFFICER
GAMBIA**

Required to carry out general extension work, including particularly oil palm nursery and plantation practices and supervise mixed farming centres and to administer and supervise main agricultural station, with limited touring.

Candidates should hold a degree in agriculture and have experience in general extension and mixed farming.

Salary scale £1,140—£2,224 a year plus 25% terminal gratuity. Starting salary to be calculated on the basis of one increment for each year's approved experience. Passages provided. 18 to 24 months contract. Education allowances. Government quarters.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details, giving full name and brief particulars of qualifications and experience quoting RC 213/68/02 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House,
Stag Place,
London, S.W.1.

**AGRICULTURAL ENGINEER
WESTERN NIGERIA**

Required to train workshop and field staff in the maintenance, use and overhaul of agricultural machinery.

Candidates, preferably between 30-40 years, should possess a degree in agricultural engineering, preferably M.Sc., plus four years' experience.

Salary £2,300 a year, subject to British income tax, plus a variable tax-free overseas allowance of either £730 (single), £1,330 (married, unaccompanied) or £1,535 (married accompanied) a year.

Passages and accommodation provided. Education allowances. Contract appointment for two tours of 15 months each.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write giving full name and brief particulars of qualifications and experience, quoting RC 213/131/01 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**Assistant Secretary Natural Resources
(Agricultural Economics)****FIJI**

Duties: To process and evaluate rural land development and production schemes in connection with national development plans.

Qualifications: Candidates who should be between 35 and 45 years of age, must hold a B.Sc. (Ag. Econ.) and have experience in the planning and execution of land development and administration.

Salary: In the range £1,208—£2,413 a year plus 25 per cent terminal gratuity. Government quarters. Education allowances. Generous leave.

Terms of appointment: On contract for two years in the first instance.

Candidates, who should be nationals of the United Kingdom or Republic of Ireland, should write for further details, giving full name and brief particulars of qualifications and experience quoting RC 213/62/09 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.



MINISTRY OF OVERSEAS DEVELOPMENT

The Ministry of Overseas Development helps to provide men and women from Britain for service in the developing countries. Terms of the following appointments in ZAMBIA include free return family passages, government quarters, children's education allowances, generous leave on full pay. Appointments will be on contract for three years and a gratuity of 25% will be paid. A supplement ranging from £200 to £300 a year is also payable direct to an officer's bank account in the United Kingdom or the Irish Republic. Salary is assessed on qualifications and experience in the range quoted.

Applicants should normally be nationals of the United Kingdom or the Republic of Ireland.

ZAMBIA

ANIMAL HUSBANDRY OFFICERS

RC. 213/132/015

DUTIES: To plan and promote schemes for the development of the animal husbandry industry, to train local extension staff in improved production and management practices and manage pilot ranching schemes on a state farming and co-operative basis.

QUALIFICATIONS AND TERMS: A degree in agriculture or animal husbandry with four years' experience in animal husbandry work. Salary £1,180 to £2,600 a year.

POULTRY OFFICER

RC. 213/132/024

DUTIES: To advise and train extension staff and farmers in all aspects of poultry production and to promote co-operation among groups of producers towards solving marketing and supply problems.

QUALIFICATIONS AND TERMS: A degree in agriculture or poultry husbandry, preferably with practical experience. Salary £1,180 to £2,600 a year.

ENTOMOLOGIST

RC. 213/132/03

DUTIES: To carry out research into the life history and control of pests of agricultural and horticultural importance.

QUALIFICATIONS AND TERMS: A degree in botany, zoology or entomology and relevant post-graduate experience in applied entomological research. Salary £1,180—£2,600 a year.

PLANT BREEDER—CEREAL

RC. 213/132/05

DUTIES: To carry out practical plant breeding on crops of economic importance in Zambia, i.e., maize, sorghum, groundnuts, grasses, pasture legumes, cassava, soya beans, kenaf, etc.

QUALIFICATIONS AND TERMS: A degree in botany together with post-graduate experience in plant breeding. Salary scale £1,180—£2,600 a year.

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PLANNING OFFICERS

RC. 213/132/020

DUTIES: To take charge of field planning teams and to be responsible for regional conservation planning on a catchment and/or settlement plan basis.

QUALIFICATIONS: A degree in agriculture or geography with post-graduate training and/or experience in the use of aerial photography, practical surveying and land use planning. Salary £1,180 to £2,600 a year.

AGRONOMISTS

RC. 213/132/021

DUTIES: To work at and possibly take charge of regional experiment stations, to be responsible for the definition of agronomic and animal husbandry programmes of applied research and to carry out applied investigational work on a regional basis.

QUALIFICATIONS AND TERMS: An honours degree in natural science together with post-graduate agricultural training, preferably with 3 to 5 years' experience in field experiment work in the tropics or sub-tropics. Salary £1,180 to £2,600 a year.

TRAINING OFFICERS

RC. 213/132/019

DUTIES: To direct and organise staff training to meet the needs of the Department of Agriculture and to direct and organise farmer training at Farm Institute and Farmer Training Centre level.

QUALIFICATIONS AND TERMS: A degree in agriculture and experience of advisory work. Previous tropical or sub-tropical experience would be an advantage. Salary £1,180—£2,600 a year.

AGRICULTURAL ENGINEER

RC. 213/132/028

DUTIES: As an extension specialist in agricultural mechanisation with specific responsibilities for training.

QUALIFICATIONS AND TERMS: A degree in either agricultural or mechanical engineering. If the latter, post-graduate qualifications in agricultural engineering will be essential. Field experience in agricultural engineering with particular emphasis on farm machinery is desirable. Salary £1,255—£2,600 a year.

CHIEF AGRICULTURAL ECONOMIST

RC. 213/132/016

DUTIES: To assume responsibility under the general direction of the Director of Economics and Marketing for the Economics Branch, to formulate detailed advice on agro-economic matters in the field of production and marketing, including project appraisals and field surveys and the compilation and dissemination of market intelligence.

QUALIFICATIONS AND TERMS: An honours degree in economics or agricultural economics or equivalent, plus about ten years' appropriate post-graduate experience in agricultural economics. A higher degree would be an advantage. Salary £2,770 a year.

For further particulars of these vacancies and an application form please write giving your full name, age and brief details of professional qualifications and experience, and quoting appropriate reference number, to the Appointments Officer,



MINISTRY OF OVERSEAS DEVELOPMENT
Room 301a, ELAND HOUSE, STAG PLACE,
LONDON S.W.1.

Please mention AGRICULTURE when corresponding with Advertisers

OFFICIAL APPOINTMENTS**ENTOMOLOGIST
HONG KONG**

Required to undertake and supervise agricultural research work and to provide appropriate specialist advice and assistance in the field of practical agricultural entomology.

Candidates must hold an honours degree in agriculture, horticulture or an appropriate natural science, plus two years post-graduate training or experience.

Salary scale (which is under review) £1,575—£2,865 a year plus a 5% allowance and a terminal gratuity. Education allowances. Children's allowance. Passages provided. Government quarters. Three-year contract.

Candidates, preferably under 35, should apply for further details, giving brief particulars of qualifications and experience, quoting RC 213/81/02 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**AGRICULTURAL ECONOMIST
WEST PAKISTAN**

Duties: Preparation, scrutiny and co-ordination of development plans, appraisal and evaluation of projects, compilation of periodical evaluation and progress reports, preparation of feasibility reports for different development projects.

Qualifications: Degree in agricultural economics with background knowledge and experience of development plans and evaluation projects.

Salary: In the range £2,500 to £3,000 a year, subject to British income tax, plus a variable tax-free foreign service allowance of £610 (single), or £1,120 (married unaccompanied) a year. Passage provided. Education allowances. Furnished accommodation. Generous leave.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should apply for further details giving full name, qualifications and experience, quoting RC 213/137/02 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**OIL PALM AGRONOMIST
SARAWAK**

Required to open up and establish a new experimental station, mainly to be concerned with oil palm and other crops new to Sarawak, e.g. cocoa and hemp.

Candidates must hold a degree in agriculture and have had post-graduate training preferably with previous experience as an agronomist.

Salary scale £1,680—£2,905 a year plus substantial terminal gratuity. Passages provided. Education and child allowances. Government quarters. 24-36 month contract.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should apply for further details, giving full name and brief particulars of qualifications and experience, quoting RC 213/155/08 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London, S.W.1.

**CHEMISTS
BRITISH GUIANA**

Required to engage in research activities on soils, plants and sugar cane. The work will include routine analyses, occasional soil surveys and advising local farmers.

Candidates should have a degree in chemistry or agricultural chemistry and two years post-graduate training or approved experience in agricultural chemistry. Preference will be given to candidates with experience in the design and analysis of field experiments in tropical countries.

Salary scale £1,616—£2,700 a year (this includes an inducement allowance of 66½% of salary) plus a terminal gratuity. Passages provided. Government quarters. Education allowances. A three-year contract. Generous leave.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details giving brief particulars of qualifications and experience, quoting RC 213/25/05 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

OFFICIAL APPOINTMENTS**ENTOMOLOGISTS
BRITISH GUIANA**

Required to set up a laboratory to investigate rice pests and diseases and to execute a control programme. Required also to undertake routine phyto-sanitary duties.

Candidates must hold a degree in zoology plus two years post-graduate training or approved experience.

Salary scale £1,616—£2,700 a year (this includes an inducement allowance of 66½% of basic salary) and a terminal gratuity. Education allowances. Children's allowances. Passages provided. Government quarters. Generous leave. Three-year contract.

Candidates should apply for further details, giving brief particulars of qualifications and experience, quoting RC 213/25/06 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**AGRICULTURAL ECONOMIST
BECHUANALAND**

Required to institute a system of routine data collection which is required to assist with farm management studies currently in progress; to direct a sample census of agriculture in collaboration with F.A.O. and to assist in drawing up costed plans for irrigation schemes at present under consideration.

Candidates must possess a degree in agricultural economics and have previous experience of African tropical agriculture.

Salary range £2,500 to £3,000 a year, subject to British income tax, plus a variable tax-free overseas allowance ranging from £255 to £780 according to marital status. Education allowances. Passages and accommodation for officer and family. Medical attention to N.H.S. standard. Two years contract.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details, giving full name and brief particulars of qualifications and experience, quoting RC 213/19/09 to:

Appointments Officer,
Room 301
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

**IRRIGATION
AGRONOMIST
BECHUANALAND**

Required to test and demonstrate irrigation on more promising soil types or areas indicated by the Soil Surveyor, and to be responsible for instigating and initiating water use trials on either areas of existing irrigation or on such new investigational or pilot projects as prove desirable and possible.

Candidates must hold a degree in agriculture with post-graduate training in field experimentation. A sound knowledge of evapo-transpiration, soil plant moisture relations and of methods of water application for crop production is essential.

Salary range £1,700 to £2,200 a year subject to British income tax, plus a tax-free overseas allowance of either £255 (Single), £760 (married unaccompanied) or £610 (married accompanied) a year. Passages provided. Education allowances. Two years contract.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details, giving full name and brief particulars of qualifications and experience, quoting RC. 213/19/08 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House, Stag Place,
London S.W.1.

BRITISH TECHNICAL ASSISTANCE**ADVISER ON AGRICULTURAL
PLANNING, BRAZIL**

Duties: To assist with general agricultural planning and to advise on methods to increase production.

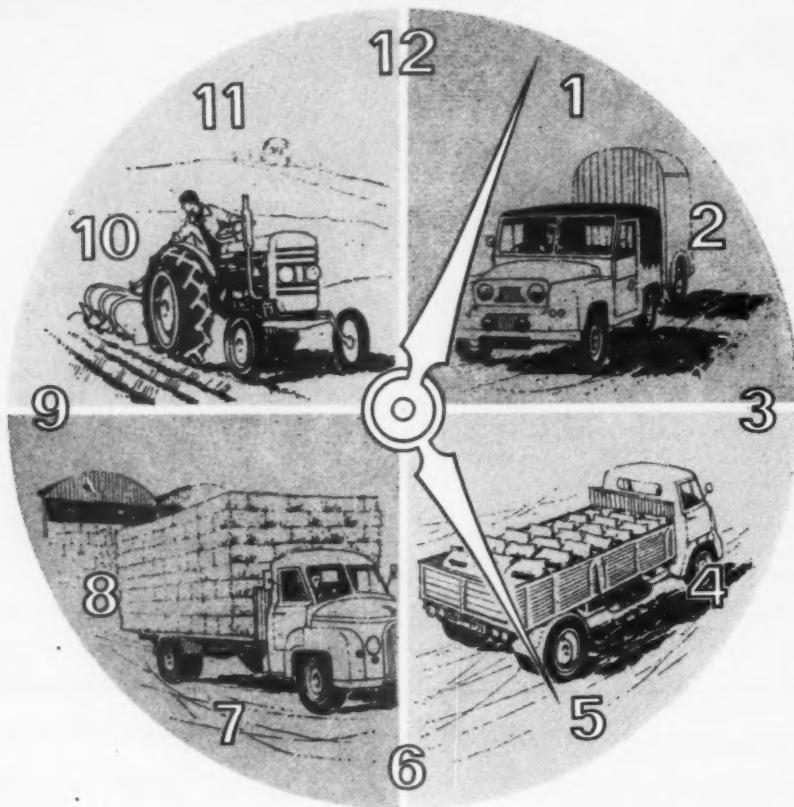
Qualifications: Degree in agriculture with preferably a diploma in tropical agriculture and wide experience of agricultural planning and development under tropical and sub-tropical conditions. A knowledge of Portuguese would be an advantage.

Salary: Probably of the order of £4,500 a year, according to the qualifications and experience of the selected candidate, subject to British income tax, plus a variable non-taxable foreign service allowance of £530 (single), £825 (married unaccompanied) or £970 (married accompanied) a year. Entertainment allowance £250 p.a. Education allowances. Passages provided. Accommodation available. 12 months' contract.

Candidates, who should be nationals of the United Kingdom or the Republic of Ireland, should write for further details giving full name and brief particulars of qualifications and experience, quoting RC 213/23/04 to:

Appointments Officer,
Room 301,
MINISTRY OF OVERSEAS DEVELOPMENT,
Eland House,
Stag Place,
London, S.W.1.

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